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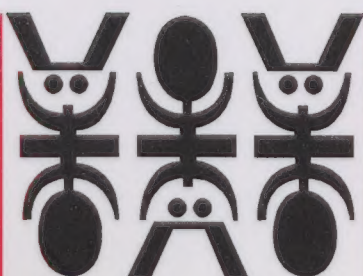
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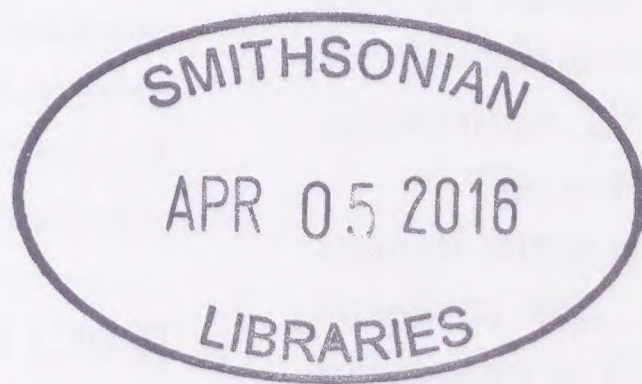
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Is the diversity of the Beach Flies adequately known? Some reflections on the state of the art of current knowledge (Diptera: Canacidae)

Riassunto: *La diversità delle Beach Flies è adeguatamente conosciuta? Alcune riflessioni sullo stato dell'arte delle attuali conoscenze (Diptera: Canacidae).*

Viene fornita una panoramica delle maggiori lacune zoogeografiche nella conoscenza dei canacidi appartenenti alle sottofamiglie Apetaeninae, Horaismopterinae, Pelomyiinae e Tethininae (tutte conosciute come Beach Flies). Le aree identificate trattate in questo lavoro sono le seguenti: la subartica Beringia, le isole circum-antartiche del Sudamerica, la Regione Neotropica a sud dell'equatore, la maggior parte delle coste marine dell'Africa occidentale, l'immensa area che va dall'India, attraverso il Golfo del Bengala, alle isole di Sumatra e Giava, nonché gran parte dell'Australia. Ad eccezione delle zone inospitali più settentrionali e più meridionali del pianeta, che sono caratterizzate da una reale biodiversità assai scarsa, le restanti vaste aree trattate in questo lavoro soffrono dolorosamente di una drammatica scarsità di raccolte sul campo, come pure di materiali raccolti nel passato e conservati in istituzioni scientifiche. Ciò potrebbe sembrare un'ovvietà che, pur tuttavia, deve essere enfatizzata allo scopo di identificare in maniera inequivocabile le aree geografiche che richiedono di essere ulteriormente indagate. Alla fine della trattazione viene fornita la distribuzione mondiale di tutte le specie citate nel lavoro.

Abstract: An overview of the major zoogeographical gaps in our knowledge of the world beach flies (subfamilies Apetaeninae, Horaismopterinae, Pelomyiinae, and Tethininae) is provided. The identified areas treated in this work are as follows: the subarctic Beringia, the South American circum-Antarctic islands, the Neotropical Region south of the equator, most of the West African seacoasts, the huge area ranging from India, across the Bay of Bengal, to Sumatra and Java, and most of Australia. Apart from the inhospitable northernmost and southernmost areas of the planet, which feature a real very low biodiversity, the remaining vast areas dealt with in this work woefully suffer a dramatic paucity of field collections, as well as of previously collected materials preserved in scientific institutions. This might seem a truism that, however, must be emphasized in order to unequivocally identify the geographic areas that need to be further investigated. At the end of the discussion, the world distribution for all species mentioned in the work is also provided.

Key words: Diptera, Canacidae, Beach flies, Biodiversity, Geographical gaps in knowledge.

INTRODUCTION

"[...] a relatively large proportion of the species in the order Diptera remains undiscovered, unnamed or unidentifiable. This is perhaps in part because of the natural attraction of insect enthusiasts to shining beetles and colorful moths, and perhaps in part because so many groups of flies are relatively small and soft-bodied, and thus more difficult to preserve and study. Up until very recently the study of most groups of flies was also rendered more challenging by a dearth of accessible literature"

Marshall (2012)

True flies of the family Canacidae occur in cool-temperate and tropical zones of the world, primarily on or near seashores with oceanic climates. A

few species are found inland, usually in saline or alkaline environments, but occasionally in meadow-like habitats (subfamily Pelomyiinae) or secondarily settled and speciated in freshwater streams of Hawaii (some species of Canacinae). The subfamily Apetaeninae is endemic in the subantarctic archipelagos. Worldwide there are 318 or so species in the family (6 subfamilies, 27 genera).

The vernacular group name "Beach Flies" (although some species do not inhabit beaches), as defined in this work, applies to the canacid flies belonging to the former family Tethinidae, which is included now in the family Canacidae *sensu lato* (the older family-group name; see McAlpine, 2007). This common (or vernacular) name applies only to the following subfamilies: Apetaeninae, Horaismopterinae,

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Pelomyiinae (the species of this subfamily are not confined to marine littoral habitats), and Tethiniinae. The vernacular group names of the other two subfamilies of the Canacidae, *i.e.* Canacinae and Zaleinae, are “Surf Flies” and “Surge Flies”, respectively. The latter vernacular name was recently coined by McAlpine (2007) for the subfamily Zaleinae, whereas the name “Surf Flies” can be found in both the past (*e.g.* Wirth, 1956) and recent (Mathis, 2010) literature dealing with the Canacidae s.str., which was recently downgraded as subfamily Canacinae (McAlpine, 2007; Munari and Mathis, 2010). Further, we can also find all of the three common names in Marshall’s (2012: 373) monograph of the order Diptera, as well as in Munari and Mathis’ (in preparation) family chapter of the Manual of Afrotropical Diptera. McAlpine (2007) stated that “such vernacular group names, if consistently applied, can be useful in communicating with non-specialists and non-entomologists, especially those concerned with research funding and conservation ecology”.

After studying and describing new genera and numerous new species of beach flies from around the

world for thirty-five years, I was asked by some entomologist colleagues whether these flies have therefore been adequately investigated in the major regions of the world, or if there are yet some large geographical gaps to be filled. Indeed, many entomologists still believe that these flies are very poorly represented, their biodiversity being rather poor in species. But, I think this is a false perception. In this regard, I will try here to answer these issues. The total number of world species belonging to the subfamilies regarded here as true beach flies currently amounts to 176 or so. Therefore, if on one hand these canacids certainly cannot be considered as a particularly species-rich group of flies, but at most a taxonomic assemblage showing a fairly low biodiversity, on the other hand these flies have always been woefully neglected by taxonomists in the past, and immense geographical areas of the planet (Fig. 1) are at present very poorly, or not at all, known as to the beach fly fauna (and Diptera in general). Conversely, some geographical areas such as the Euro-Mediterranean sub-region, the Nearctic Region, the Gulf of Mexico and the Caribbean, Japan, the subantarctic islands of South Africa and New Zealand, have been adequately inves-

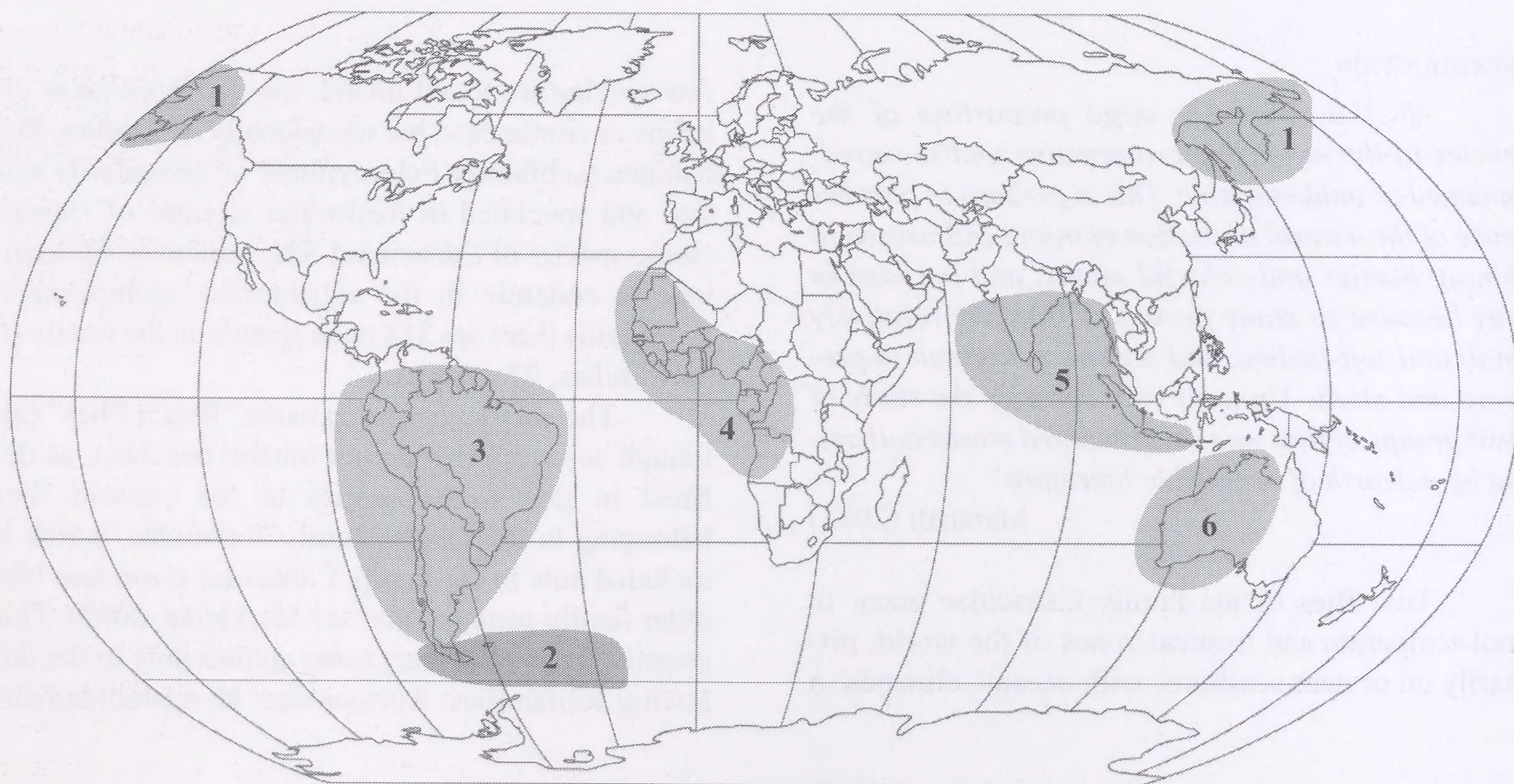


Fig. 1. Planisphere indicating the major hiatuses (areas in colour) of the beach fly spatial distribution in the world. The different colour of the South American subantarctic area indicates the complete lack of beach fly records, especially those relating to the subfamily Apetaeninae. The numbering of the areas in colour refers to the respective sections of the text.

tigated (although new species are still occasionally described); other areas, such as the eastern seacoasts of the Oriental and Afrotropical Regions, as well as those of eastern Australia, are fairly well known, although many new species are expected to be found in the future. The diverse, remote archipelagos of Oceania (Melanesia, Polynesia and Micronesia) represent another immense oceanic region where the beach fly fauna has been widely investigated in several publications, especially by Munari and by Sasakawa (for details, see Munari and Mathis, 2010). Lastly, the beach flies of the remote Hawaiian Islands were dealt with mainly by Hardy and Delfinado (1980) and by Munari and Evenhuis (2011). No endemic species was found so far in such islands.

This work deals almost exclusively with the maritime environments, leaving out all those geographical zones with continental, eremic or suberemic, saline habitats, which are, for the most part, almost completely unknown. In this connection, as concerns the beach fly fauna from some continental habitats of Central Asia and North Africa-Middle East, the reader is referred to Beschovski and Nartshuk (1997) and Munari (2005a), respectively.

THE BEACH FLY DIVERSITY: MAJOR GEOGRAPHICAL HIATUSES IN OUR KNOWLEDGE

1. THE BERINGIAN HIATUS. The Beringian region, or Beringia, is intended here in its southernmost area, but widened to include a larger area ranging from the Sea of Okhotsk (Russian Far East), through the Bering Sea, to southern Alaska. Only two species of beach flies have been recorded so far from this huge area, *Pelomyiella mallochi* (Sturtevant, 1923) from Alaska (United States) and *Tethina thula* Sasakawa, 1986 from Alaska, as well as from Chishima Islands (Sasakawa, 2014) and Hokkaido (both in northern Japan). The latter two Japanese areas are bathed by the southernmost waters of the Sea of Okhotsk. For most of the above citations, see the references in Munari and Mathis (2010). As for the paucity of biodiversity data for the beach flies inhabiting other high-latitudes areas, we can find an emblematic evidence in Kahanpää's (2014) checklist dealing with some acalyptrate families from Finland. In this work, the Finnish author did not cite any species of Tethininae from Finland, excluding the only two species, i.e. *Tethina grisea* (Fallén, 1823) and *T. illota* (Haliday, 1838), previously reported from the literature by Munari and Mathis (2010). Indeed, Ka-

hanpää (2014) regarded the occurrence of these two species in Finland as very doubtful. However, a pelomyiine species (subfamily Pelomyiinae), *Pelomyiella cinerella* (Haliday, 1837), is known from Finland (Munari and Mathis, 2010; Kahanpää, 2014). Furthermore, Munari (2011) also recorded an additional species of pelomyiine fly, *Pelomyiella mallochi* (Sturtevant, 1923), from the Russian Arctic territories (Yamal Peninsula, 70°11' N – 67°17' E). Apart from Alaska and the above-mentioned Russian record, this very common and widely distributed species is also known at high-latitudes from the Northwest Territories of Canada and from Greenland (Munari and Mathis, 2010). Therefore, we can affirm, with a reasonable reliability, that the beach fly fauna from high-latitudes territories is very poorly represented, even though it has been scarcely investigated. Thus, the Beringian hiatus is probably only apparent, due to the often extreme living conditions in this cold, subarctic region.

2. THE SOUTH AMERICAN SUBANTARCTIC HIATUS: THE SUBANTARCTIC ISLANDS OF SOUTH AMERICA (INCLUDING TIERRA DEL FUEGO AND FALKLANDS) AND OF THE SOUTHERN ATLANTIC OCEAN. Apart from one species of Pelomyiinae, *Pelomyia fuegina* Munari, 2010, described from Tierra del Fuego and known only from the type locality (Estancia Viamonte, Auricosta), no other species of beach flies, especially the subantarctic endemic subfamily Apetaeninae, is recorded from this southernmost, extreme oceanic area. As for this subfamily, Munari (2008) stated that "[...] although we know these flies exhaustively from both the Kerguelen Biogeographical Province and New Zealand-Australian subantarctic islands, no species is known so far from the subantarctic territories of South America [...], viz. Southern Patagonia (including Tierra del Fuego Island), Falklands, South Georgia, South Sandwich, Austral Shetland, South Orkney islands, and the easternmost, oceanic Bouvet Island (Bouvetøia)". In the same paper the author also says that "Since many of these islands are overseas British possessions, I hopefully supposed that a number of specimens could be found in the collection of the Natural History Museum, London, as a result of British, subantarctic, entomological expeditions carried out in the past". Nevertheless, the curator of Diptera of that museum informed that no specimens of Apetaeninae from the subantarctic lands of South America had been found in the collection of the London museum. The same kind of negative answer was also

given by the curator of the Diptera collection at the Smithsonian National Museum of Natural History, Washington. No doubt, there is a reasonable expectation to find these flies from those cold, windy, rocky sea-coasts. This is because the latitudinal, climatic, and environmental characteristics of those mostly inhospitable oceanic places north of 60°S (except for the South Orkney Islands which are 60°35'S) are, to a large extent, the same as in all other circum-Antarctic islands, where, on the contrary, the apetaenine flies are well represented (Fig. 2) (Munari, 2007; 2008). Thus, the low biodiversity occurring in the subantarctic islands gives no apparent reason for accounting for the absence of the apetaenine flies in the subantarctic insular lands of South America. On the other hand, it is also true that an ecologically very similar and commonly recorded family of seaweed flies, Coelopidae, is strangely absent from the wrack-rich coasts of southern South America, where it seems to be replaced by superficially similar flies in the related family Helcomyzidae (Marshall, 2012). Indeed, the helcomyzid genus *Paractora* Bigot, 1888, occurs mostly in southern South America, where its species seem to replace Coelopidae as the dominant large wrack flies (Marshall, 2012). In those circumstances, it is not unlikely that even the apetaenine flies have been replaced in those lands by more competitive large wrack flies. However, to disprove this, at least in part, Crafford *et al.* (1986) state that, in the Kerguelen Province, dense aggregates of adults of *Apetaenus litoralis* Eaton, 1875 (Canacidae, Apetaeninae) may be found sheltering with adults of *Paractora dreuxi mirabilis* Séguy, 1971 (Helcomyzidae) amongst fronds of stranded *Durvillaea antarctica* (Chamisso) Hariot (Durvillaeales). Munari (2007; 2008) provides a great number of detailed remarks about the habitats and the microhabitats of the Apetaeninae and other seaweed flies from the Kerguelen province, as well as from the subantarctic islands of New Zealand. In conclusion, we can say that the absence of the apetaenine flies in the sub-antarctic South America still remains an unresolved issue. It is hoped that this hiatus will be filled when specialized fly collections are targeted on those islands (also see the “conclusions” at the end of this work).

Number and distribution of the apetenine species/subspecies in the Circum-Antarctic belt:

- i) Subantarctic islands of South America: 0
- ii) Subantarctic islands of South Africa (Kerguelen Province): 3
- iii) Subantarctic islands of New Zealand: 3

No species/subspecies occurs in the same sub-antarctic provinces.

3. THE SOUTH AMERICAN HIATUS: THE NEOTROPICAL REGION SOUTH OF THE EQUATOR. This is an immense zoogeographical region with thousands of kilometres of coastal environments mostly ranging from north to south and bathed by the waters of the Atlantic (East Coast) and Pacific (West Coast) Oceans. The beach flies are represented by the genera *Pelomyia* Williston, 1893, *Masoniella* Vockeroth, (1987, published as *nomen nudum*) 1995 (validation), *Dasyrhicnoessa* Hendel, 1934 (occurring with one species only), and *Tethina* Haliday, 1837.

Far from being exhaustively represented, nevertheless the subfamily Pelomyiinae is fairly well known in this huge region, especially thanks to Foster and Mathis' (2003) revision of the only two genera occurring in South America, namely *Pelomyia* and *Ma-*

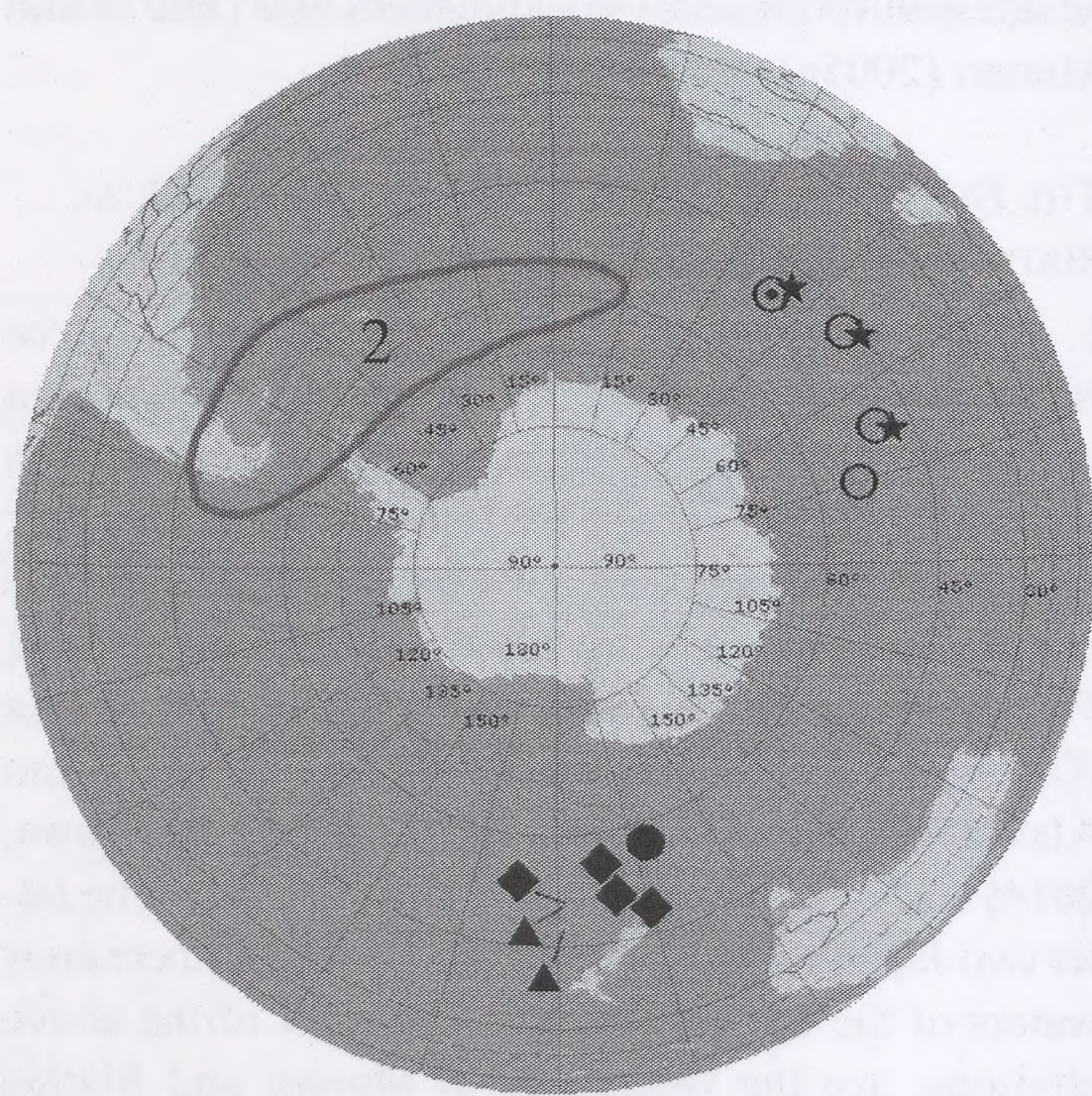


Fig. 2. Distributional map of the subfamily Apetaeninae (as for the insular toponyms, see the distributions given in Munari, 2007, 2008). Slightly modified after Munari, 2008.

Legend: geographical area delimited by a thick grey line (section 2 of the text)=zoogeographical gap (no species has been recorded so far); ○=*A. (Apetaenus) litoralis litoralis* Eaton; ◐=*A. (Apetaenus) litoralis marionensis* Munari; ●=*A. (Apetaenus) litoralis watsoni* Hardy; ★=*(Listriomastax) enderleini* Munari; ◆=*(Macrocanace) australis* (Hutton); ▲=*(Macrocanace) littoreus* (Hutton).

soniella. In that revision, Foster and Mathis recorded all species from the previous literature and described 5 new species of *Masoniella* and 22 of *Pelomyia* from the Neotropical Region. Munari (2010; 2013) also described a few additional new species of pelomyiine flies from this region [for a detailed list of species, the reader is referred to Foster and Mathis' (2003) and Munari's (2010; 2013) papers]. As concerns the subfamily Tethinae, the Galápagos archipelago represents a fairly investigated area (Foster and Mathis, 2008), with three species of *Tethina* recorded so far, i.e. *T. albula* (Loew, 1869), *T. insulans* Curran, 1932, and *T. spinulosa* Cole, 1923. Except for these two above-mentioned cases, very little is known about the diversity of the Tethinae inhabiting South America south of the equator. The fauna of these flies from the western (Pacific) continental seacoast is very poorly known, with only six species of *Tethina*, mostly recorded from Chile (see further), i.e. *T. albitarsa* Foster and Mathis, 1998, *T. albula* (Loew, 1869), *T. pallipes* (described by Malloch (1934) from Chile as *T. chilensis*, a junior synonym), *T. robusta* Foster and Mathis, 2000, *T. spinulosa*, and *T. willistoni* (Melander, 1913). An even worse situation occurs for the tethinine species of the Atlantic seacoast. Only one species of *Dasyrhicnoessa*, *D. insularis* (Aldrich, 1931), and four species of *Tethina*, namely *T. albula*, *T. brasiliensis* Prado and Tavares, 1966, *T. willistoni*, and *T. xanthopoda* (Williston, 1896), have been recorded so far from this immense area. From a zoogeographical point of view, the taxonomic affinities for the tethinine species are exclusively towards the north (excepting *Dasyrhicnoessa insularis*, which is a very common pantropical species), specifically to the Nearctic Region, whereas the pelomyiine species have, to a large extent, their centre of dispersion just in the vast area treated here. The beach fly fauna of this area necessarily needs a lot of field collections in diversified saline habitats, especially those in proximity to the seacoast (including mangrove swamps). Indeed, numerous undescribed species will be expected to be found on both the Pacific and Atlantic seacoasts of this continent.

Number and distribution of the Beach Fly species recorded in the New World:

- i) Nearctic Region: 29
 - ii) Neotropical Region (including Central America and South America north of the Equator): 42
- Eight species occur in both the Regions.

4. THE WEST AFRICAN HIATUS (FROM ANGOLA TO WESTERN SAHARA). The area treated herein intentionally excludes the countries of Namibia (to the south) and Morocco (to the north). As to the beach fly fauna, the former country was exhaustively investigated (though dealing exclusively with the intertidal habitats of the seacoast) especially by Kirk-Spriggs *et al.* (2001), but other additional citations can be found in Munari and Mathis' (2010) world catalogue of the family. For the species of Morocco, the reader is referred to the citations in the latter publication. Differently from the fairly well-known fauna of the East African seacoast, that inhabiting the seashores of West Africa has woefully been poorly investigated. Although with some misidentifications (for details see Munari and Baez, 2000), Frey (1958) published a paper dealing with the Diptera of the Cape Verde Islands. Cogan's (1980) catalogue of Afrotropical Diptera also reported those misidentifications uncritically. In these outdated publications, which were the most complete references available at that time, an undescribed species, i.e. *Tethina amphitrite* Munari and Baez, 2000, was misidentified with the common *T. incisuralis* (Macquart, 1851), which has never correctly been recorded from the Cape Verde Islands. The confusion between the two species arose in that *T. amphitrite* is very similar externally to Macquart's species, and both the species share the same kind of maritime habitat. Vanschuytbroeck (1976) reported *T. alboguttata* (Strobl, 1900) from the remote, oceanic island of St. Helena in the southern Atlantic Ocean. The identifications made by Vanschuytbroeck were partly confirmed by Munari (1994), who examined a single female specimen. However, a second male specimen from the same locality remained undetermined because of its poor condition of preservation (Munari, 1994). Excepting the above-mentioned records, only very few additional species were reported in the literature of those years (Cogan, 1980). Later, some other species were also recorded or newly described from the continental seacoast of western Africa (detailed references are in Munari and Mathis, 2010): *Afrotethina kaplanae* Munari, 1994 (from Cameroon and Sierra Leone), *Dasyrhicnoessa insularis* (from Cameroon, Nigeria, and Sierra Leone), *Tethina albosetulosa* (Strobl, 1900) (from Senegal), *T. soikai* Munari, 1981a (from the Cape Verde Islands and Senegal). Two other species, namely *T. grossipes* (Becker, 1908) (from the Cape Verde Islands) and *T.*

pallipes (from the Cape Verde Islands and Senegal), were also recorded by Cogan (1980) from the islands of Cape Verde.

Apart from the four citations from the Cape Verde Islands, we can realize the extreme shortage of field collections throughout this immense area ranging from the southernmost boundaries of Angola to the northernmost ones of Western Sahara. Furthermore, we do not know if a few species of the afrotropical genus *Horaismoptera* Hendel, 1907 (subfamily Horaismopterinae) inhabit the beaches of western Africa north of Namibia, as the westernmost records of this afrotropical genus are from the latter country and refer to *H. microphthalma* (Bezzi, 1908). This species was described from Namibia (Lüderitz Bay) and subsequently reported from the same country by Kirk-Spriggs *et al.* (2001) and by Munari (2009) (Fig. 3). *H. microphthalma* occurs mainly on rocky and sandy beaches, where abundant kelp heaps and marine debris have been washed up by the waves. Also, Kirk-Spriggs *et al.* (2001) recorded from Namibia some species of another endemic afrotropical genus, *i.e.* *Afrotethina* Munari, 1986, which is rather common (eight species are known) in southern and eastern Africa, as well as in the Arabian Peninsula. However, in the western beaches (north of Namibia), only one species of this genus, *A. kaplanae*, is known from Cameroon and Sierra Leone, and no additional species have been recorded so far.

Number and distribution of the Beach Fly species recorded in the Afrotropical Region:

- i) West Africa: 11
- ii) South and East Africa (excluding Madagascar, but including the small oceanic archipelagos): 25
- iii) Madagascar: 6

Number of shared species:

- i) West Africa - South and East Africa: 5
- ii) West Africa - Madagascar: 1
- iii) South and East Africa - Madagascar: 5

5. THE INDIAN HIATUS: FROM INDIA, ACROSS THE BAY OF BENGAL, TO SUMATRA AND JAVA. Along with most of Australia (see further), this is one of the most poorly investigated huge areas of the world (at least as far as the beach flies are concerned). Only seven species of these flies have been recorded inhabiting this immense territory ranging from the western seacoast of India to Java, four of them being known from the large island of Sri Lanka, *i.e.* *Horaismoptera hennigi* Sabrosky,

1978, *Dasyrhicnoessa fulva* (Hendel, 1913), *Dasyrhicnoessa vockerothi* Hardy and Delfinado, 1980, and *Pseudorhicnoessa rattii* Munari, 1981b. Especially noteworthy is the first species, which belongs to an afrotropical genus and is, in all probability, a vicariant species of an ancestral lineage, whose extant species still inhabit the seacoasts of Africa and the Arabian Peninsula (Fig. 3). Therefore, its taxonomic affinities are to the west and southwest, and specifically with the eastern and southern afrotropical seashores. *Pseudorhicnoessa rattii* is also known from western India (state of Goa), in addition to some archipelagos of the western Indian Ocean (see further). This species is the western vicariant of *P. spinipes* Malloch, 1914, the latter widely distributed in the western Pacific Ocean as far as the Sunda Islands. The few remaining species of the Indian hiatus are the following: *Dasyrhicnoessa adelpha* Munari, 2005, so far exclusively known from West India (state of Goa), the common *Pseudorhicnoessa spinipes*, with a few records (six specimens in all) from southeastern Thailand (Munari, 2005b), and the subcosmopolitan *Tethina pallipes*, with an isolated, continental (an inland area over 700 km from the nearest seacoast) record from India (Munari, 2009). Apart from the two species *Horaismoptera hennigi* and *Dasyrhicnoessa adelpha*, which are known from the types only, the other species show taxonomic affinities to the east, espe-

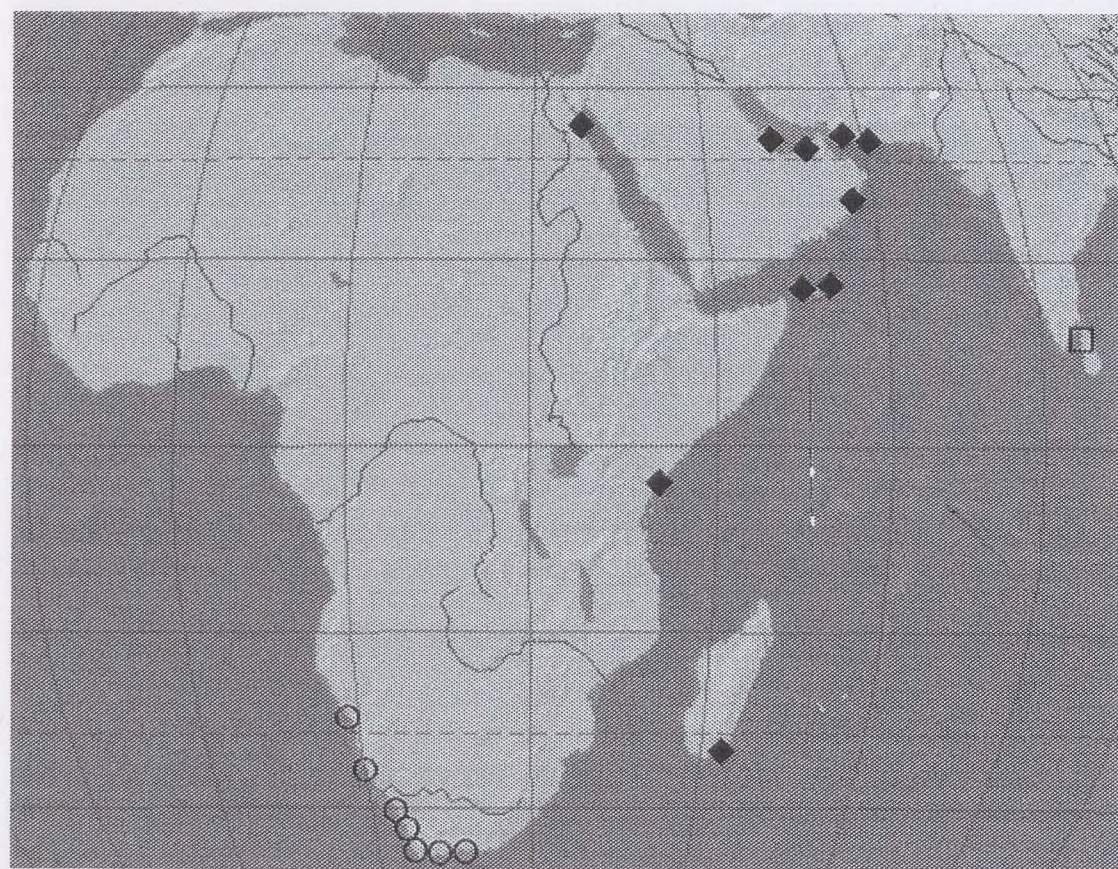


Fig. 3. Distribution map for the species of the genus *Horaismoptera* Hendel: *H. hennigi* Sabrosky (open square), *H. microphthalma* (Bezzi) (open circles), *H. vulpina* Hendel (diamonds). After Munari, 2009.

cially with the Indo-Malay and western Pacific areas, excepting *Pseudorhinoessa rattii* which exclusively inhabits the beaches of the Indian Ocean.

Similar to many other geographical areas, shortage of field collections and especially the dramatic scarcity of local fly collectors (if any) have caused, as a consequence, an extreme paucity of materials available for study. Given the abundance of mangrove swamps on the seacoasts of this territory, many previously described, or even undescribed, species of *Dasyrhinoessa* are therefore expected to be found, they being rather strictly associated with the clay tidal flats in the mangrove environment.

Number and distribution of the Beach Fly species recorded in the Oriental Region:

- i) Western Oriental Region (this side is that treated in this work): 8
- ii) Eastern Oriental Region: 10

Four species occur in both the western and eastern areas.

The whole Oriental Region dramatically suffers a critical shortage of findings, especially the west side of the Region.

6. THE AUSTRALIAN HIATUS: NORTH, SOUTH, AND WEST AUSTRALIA. With regard to Australia, our knowledge contains a huge gap, as little is known about the beach flies of the Northern Territory, Western Australia and South Australia. An indication of this is the fairly recent discovery of two new genera and three new species from Western Australia (Munari, 2004), which were segregated from extremely scanty material, as a result of quite occasional field collections. Marshall (2012) stated that “the 19,000 or so species of flies currently known from the Australasian region probably represent considerably less than half of the actual fauna”, endemism at the generic and specific level being very high, with many characteristic regional undescribed taxa. Five species are currently known from the Northern Territory, namely *Dasyrhinoessa ciliata* Munari, 2004, *D. macalpinei* Munari, 2004, the common *D. vockerothi* and *Pseudorhinoessa spinipes*, and *Sigaloethina phaia* Munari, 2004, three of which were recently described (Munari, 2004). Four additional species, including two recently described genera, are known inhabiting the seashores of Western Australia, namely *Plesiotethina australis* Munari, 2000, *Tethina hirsuta* Munari, 2000, the common *T. pallidiseta* Malloch, 1935, and *Thitena cadav-*

erina Munari, 2004. Even worse, no species of beach flies from South Australia has been reported so far in the literature.

The above-mentioned genera *Plesiotethina* Munari, 2000, *Sigaloethina* Munari, 2004, and *Thitena* Munari, 2004 are, in all probability, endemic to Australia, except perhaps for the genus *Sigaloethina* that could likely occur in Papua New Guinea, too. *Plesiotethina* is noteworthy for being an enigmatic genus of uncertain placement at the subfamilial level within the former family Tethinidae (beach flies). So far, the most comprehensive papers dealing with the Australian beach fly fauna are those recently published by Munari (2000; 2004), in which three new genera and twelve new species were described, especially from the eastern coast of Australia (Munari, 2004), where there are the higher concentration of dipterist specialists as well as the largest dipterological collections housed in important scientific institutions (ANIC-CSIRO, Canberra) and museums (Sydney).

Number and distribution of the Beach Fly species recorded in Australia:

- i) Northern Territory: 5
- ii) Western Australia: 5
- iii) South Australia: 0
- iv) Eastern coast of Australia (from Queensland south to Tasmania): 18

Number of shared species:

- i) Northern Territory - Eastern coast: 3
- ii) Western Australia - Eastern coast: 1
- iii) Northern Territory - Western Australia: 0

CONCLUSIONS

Like many other families of flies, the scenario shown in the present work features the extreme paucity of past and recent field collections in the examined geographical areas, rather than a very low diversity as concerns the beach flies, which represent worldwide more than 55% of the overall biodiversity of the entire family Canacidae (that is, including the subfamilies Canacinae (Surf Flies) and Zaleinae (Surge Flies)). This might seem a truism that, however, must be emphasized in order to unequivocally identify the geographic areas that need to be further investigated. In this context, the most dramatic gap in our knowledge is that relating to the South American subantarctic hiatus. It would actually be extremely interesting to know which apetaenine species (if any!) inhabit the subantarctic islands of South America, as

no record has been reported so far in the literature (see details in the above section dedicated to this area). This would allow us better to understand the phylogenetic relationships that exist between all species of circum-Antarctic apetenine flies (Munari, 2007; 2008). This cold, oceanic, circum-Antarctic belt was revealingly named “Insulantarctica” according to the classification developed by Udvardy (1975). It is a biogeographical province of the Antarctic Biogeographical Realm, which comprises scattered islands of the Southern Ocean showing clear affinity to each other. As for the other huge zoogeographical hiatuses, we can notice the extreme paucity of data for the

Neotropics (south of the equator), West Africa, and the northern and eastern Indian Ocean, including the sea-coasts of most of Australia. Several undescribed species are expected to be found in these areas, especially from the Australian seashores, where new genera and species predictably occur.

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REFERENCES

- ALDRICH J.M., 1931 - New Acalyptrate Diptera from the Pacific and Oriental Regions. *Proceedings of the Hawaiian Entomological Society*, 7(3): 395-399.
- BECKER T., 1908 - Dipteren der Kanarischen Inseln. *Mitteilungen aus dem Zoologischen Museum in Berlin*, 4(1): 1-180.
- BESCHOVSKI V.L., NARTSHUK E.P., 1997 - The Tethinidae species in the collection of the Zoological Institute in St. Petersburg (Insecta: Diptera: Tethinidae). *Reichenbachia*, 32(22): 129-141.
- BIGOT J.M.F., 1888 - Dipteres [sect. v.]. Pp. 1-45, pls. 1-4. In: *Ministères de la Marine et de l'Instruction Publique, Mission scientifique du Cap Horn. 1882-1883. Tome VI. Zoologie. Insectes*. Gauthier-Villars et Fils, Paris.
- COGAN B.H., 1980 - 78 - Family Tethinidae. In: CROSSKEY R.W., (ed), *Catalogue of the Diptera of the Afrotropical Region*. British Museum (Natural History). London: page 693.
- COLE F.R., 1923 - Expedition of the California Academy of Sciences to the Gulf of California in 1921. Diptera from the Islands and Adjacent Shores of the Gulf of California. II. General Report. *Proceedings of the California Academy of Sciences*, 12(25): 457-481.
- CRAFFORD J.E., SCHOLTZ C.H., CHOWN S.L., 1986 - The insects of sub-Antarctic Marion and Prince Edward Islands; with a bibliography of Entomology of the Kerguelen Biogeographical Province. *South African journal of antarctic research*, 16(2): 42-84.
- CURRAN C.H., 1932 - The Norwegian Zoological Expedition to the Galapagos Islands 1925, Conducted by Alf Wollebaek. IV. Diptera. (Excl. of Tipulidae and Culicidae). *Meddelelser fra det Zoologiske Museum, Oslo*, 30: 347-366.
- EATON A.E., 1875 - Breves Dipterarum uniusque Lepidopterarum insulae Kerguelensi indigenarum diagnoses. *The Entomologist's Monthly Magazine*, 12: 58-61.
- FALLÉN C.F., 1823 - *Agromyzides Sveciae*. Berling, Lundae [= Lund], 10 pages.
- FOSTER G.A., MATHIS W.N., 1998 - A Revision of the Family Tethinidae (Diptera) from the Caribbean, Gulf of Mexico, and Bermuda. *Proceedings of the Entomological Society of Washington*, 100(4): 601-632.
- FOSTER G.A., MATHIS W.N., 2000 - Notes on Neotropical species of Tethina Haliday (Diptera: Tethinidae). *Proceedings of the Entomological Society of Washington*, 102(3): 542-548.
- FOSTER G.A., MATHIS W.N., 2003 - A revision of the genera *Pelomyia* Williston and *Masoniella* Vockeroth (Diptera: Tethinidae). *Smithsonian Contributions to Zoology*, 619: 1-63.
- FOSTER G.A., MATHIS W.N., 2008 - A review of the Tethininae (Diptera: Canacidae) from the Galápagos Islands. *Proceedings of the Entomological Society of Washington*, 110(3): 743-752.
- FREY R., 1958 - Zur Kenntnis der Diptera brachycera p.p. der Kapverdischen Inseln. *Commentationes Biologicae*, 18(4): 1-61.
- HALIDAY A.H., 1837 - Notes & c. upon Diptera. *Entomological Magazine*, 4(2): 147-152.
- HALIDAY A.H., 1838 - New British Insects Indicated in Mr. Curtis's Guide [part]. *Annals and Magazine of Natural History*, 2: 183-190.

- HARDY D.E., DELFINADO M.D., 1980 - Family Tethinidae. In: HARDY D.E., DELFINADO M.D., (eds), *Insects of Hawaii*, 13: 369-379. Diptera: Cyclorrhapha III. Honolulu: University Press of Hawaii, 451 pages.
- HENDEL F., 1913 - Acalyptrate Musciden (Dipt.) II. In: H. Sauter's *Formosa-Ausbeute*. *Supplementa Entomologica*, 2: 77-112.
- HENDEL F., 1934 - Revision der Tethiniden (Dipt. Muscid. acal.). *Tijdschrift voor Entomologie*, 77: 37-54.
- KAHANPÄÄ J., 2014 - Checklist of the Diptera families Acartophthalmidae, Canacidae (including Tethinidae), Carnidae and Milichiidae of Finland (Insecta). *ZooKeys*, 441: 305-309.
- KIRK-SPRIGGS A.H., ISMAY J.W., ACKLAND M., ROHÁČEK J., MATHIS W.N., FOSTER G.A., PAPE T., CRANSTON P.S., MEIER R., 2001 - Inter-tidal Diptera of southwestern Africa (Chironomidae, Canacidae, Chloropidae, Milichiidae, Tethinidae, Ephydriidae, Sphaeroceridae, Coelopidae, Sarcophagidae and Anthomyiidae). *Cimbebasia*, 17: 85-135.
- LOEW H., 1865 - Ueber die europäischen Arten der Gattung *Rhinoessa*. *Berliner Entomologische Zeitschrift*, 9: 34-39.
- LOEW H., 1869 - Diptera Americae septentrionalis indigena. *Berliner Entomologische Zeitschrift*, 13: 1-52.
- MALLOCH J.R., 1914 - Formosan Agromyzidae. *Annales Musei Nationalis Hungarici*, 12: 306-336.
- MALLOCH J.R., 1934 - Tethinidae. In: Edwards F.W., (ed), *Diptera of Patagonia and South Chile*, 6(5): 452-460. London: British Museum (Natural History), 393-490 pages.
- MALLOCH J.R., 1935 - Notes on and descriptions of new species of Australian Diptera. *Australian Zoologist*, 8(2): 87-95.
- MARSHALL S.A., 2012 - *Flies: the natural history and diversity of Diptera*. Firefly Books Ltd., 616 pages.
- MATHIS W.N., 2010 - 89. Canacidae (Surf Flies). In: BROWN B.V., BORKENT A., CUMMING J.M., WOOD D.M., WOODLEY N.E., ZUMBADO M.A., (eds), *Manual of Central American Diptera*, Volume 2, NRC Research Press, Ottawa, 728 pp. (Canacidae on pages 1115-1119).
- MCALPINE D.K., 2007 - The surge flies (Diptera: Canacidae: Zaleinae) of Australasia and notes on Tethinid-Canacid morphology and relationships. *Records of the Australian Museum*, 59(1): 27-64.
- MELANDER A.L., 1913 - A synopsis of the dipterous groups Agromyzinae, Milichinae, Ochthiphilinae and Geomyzinae. *Journal of the New York Entomological Society*, 21(4): 283-300.
- MUNARI L., 1981a - Tre nuove *Tethina* Haliday raccolte dal Prof. A. Giordani Soika in Asia minore e Senegal (Diptera, Tethinidae). *Bollettino del Museo civico di Storia naturale di Venezia*, 31(1980): 139-144.
- MUNARI L., 1981b - Sul genere *Pseudorhinoessa* Malloch, 1914 (Diptera Tethinidae). *Società Veneziana di Scienze Naturali - Lavori*, 6: 91-96.
- MUNARI L., 1994 - Contribution to the knowledge of Afrotropical Tethinidae. VII. New species and records, with a check-list of Afrotropical species (Diptera, Acalyptratae). *Società Veneziana di Scienze Naturali - Lavori*, 19: 15-28.
- MUNARI L., 2000 - Beach Flies from south-western coast of Australia, with descriptions of a new genus and two new species (Diptera Tethinidae). *Bollettino della Società Entomologica Italiana*, 132(3): 237-248.
- MUNARI L., 2004 - Beach Flies (Diptera: Tethinidae: Tethininae) from Australia and Papua New Guinea, with descriptions of two new genera and ten new species. *Records of the Australian Museum*, Sydney, 56(1): 29-56.
- MUNARI L., 2005a - Species of *Tethina* Haliday from the Sahara and inland biotopes of the Mediterranean subregion (Diptera: Tethinidae). *Stuttgarter Beiträge zur Naturkunde, Serie A (Biologie)*, 683: 1-11.
- MUNARI L., 2005b - Indo-Pacific beach flies (Diptera: Tethinidae): New species and records from the Indian and Western Pacific Oceans. *Studia dipterologica*, 11(2) (2004): 585-596.
- MUNARI L., 2007 - Studies on the Canacidae (Diptera), subfamily Apetaeninae. I. *Apetaenus enderleini*, nomen novum for *Listriomastax litorea* Enderlein, 1909, with remarks on the chaetotaxy, morphology, and habitats of the Apetaeninae from the Kerguelen Biogeographical Province. *Zootaxa*, 1542: 21-34.
- MUNARI L., 2008 - Studies on the Canacidae (Diptera), subfamily Apetaeninae. II. A review of the world subgenera of *Apetaenus* Eaton, with a special reference to the Australian and New Zealand species. *Zootaxa*, 1692: 26-42.
- MUNARI L., 2009 - New or interesting records of beach flies from the Afrotropical and Oriental Regions (Diptera: Canacidae: Horaismopterinae, Tethininae). *Bollettino del Museo civico di Storia naturale di Venezia*, 59(2008): 55-59.
- MUNARI L., 2010 - Canacidae and Australimyzidae (Diptera) collected by Danish Scientific Expeditions and by N.L.H. Krauss, with descriptions of four new species. *Steenstrupia*, 32(1): 51-68.
- MUNARI L., 2011 - The Euro-Mediterranean Canacidae s.l. (including Tethinidae): keys and remarks to genera and species (Insecta, Diptera). *Bollettino del Museo di Storia Naturale di Venezia*, 62: 55-86.

- MUNARI L., 2013 - A new species of *Pelomyia* Williston, 1893 from Chile (Diptera: Canacidae: Pelomyiinae). *Società Veneziana di Scienze Naturali - Lavori*, 38: 21-26.
- MUNARI L., BÁEZ M., 2000 - The Tethinidae of Macaronesia: a faunal revision, with descriptions of two new species (Diptera). *Bollettino del Museo civico di Storia naturale di Venezia*, 50(1999): 3-30.
- MUNARI L., EVENHUIS N.L., 2011 - The subfamily Tethininae (Diptera: Canacidae) in the Hawaiian Islands. *Bishop Museum Occasional Papers*, 109: 25-34.
- MUNARI L., MATHIS W.N., 2010 - World Catalog of the Family Canacidae (including Tethinidae) (Diptera), with keys to the supraspecific taxa. *Zootaxa*, 2471: 1-84.
- MUNARI L., MATHIS W.N., (in preparation) - 94. Canacidae (Beach Flies, Surf Flies and Surge Flies). In, A. Kirk-Spriggs and M. Mostovski, editors, *Manual of Afrotropical Diptera*, Vol. 2 [release planned for 2018].
- PRADO A.P. DO, TAVARES O., 1966 - Sobre duas espécies novas do gênero "*Tethina*" Haliday, 1838 (Diptera, Tethinidae). *Revista Brasileira de Biologia*, 26(4) : 429-439.
- SABROSKY C.W., 1978 - The family position of the peculiar genus *Horaismoptera* (Diptera: Tethinidae). *Entomologica Germanica*, 4(3/4): 327-336.
- SASAKAWA M., 1986 - A revision of the Japanese Tethinidae (Diptera). *Kontyû*, 54(3): 433-441.
- SASAKAWA M., 2014 - Family Canacidae. In, T. Nakamura, T. Saigusa and M. Suwa, editors, *Catalogue of the Insects of Japan*. Vol. 8 Diptera (Part 2, Brachicera Schizophora). *Entomological Society of Japan*, xiv+562 pp.
- SÉGUY E., 1971 - Diptera. Pp. 344-348. In: VAN ZINDEREN BAKKER E.M. VAN, WINTERBOTTOM J.M. AND DYER R.A. (eds), *Marion and Prince Edward Islands. Report on the South African biological and geological expedition 1965-1966*. Sponsored by the Department of Transport of the Republic of South Africa and supervised by the South African Scientific Committee for Antarctic Research. A.A. Balkema, Cape Town, xi+427 pp.
- STROBL G., 1900 - Spanische Dipteren. *Wiener Entomologische Zeitung*, 19: 1-10.
- STURTEVANT A.H., 1923 - New species and notes on synonymy and distribution of Muscidae Acalypteratae (Diptera). *American Museum Novitates*, 76: 1-12.
- UDVARDY M.D.F., 1975 - A classification of the biogeographical provinces of the world. *IUCN Occasional Paper*, Morges, Switzerland, 18: 1-48.
- VANSCHUYTBROECK P., 1976 - 22. Fam. Tethinidae. In: *La Faune Terrestre de l'Île de Sainte-Hélène*, page 106. *Annales, Musée Royal de L'Afrique Centrale*, Tervuren, Belgique, series IN-8, Sciences Zoologiques No. 215.
- VOCKEROTH J.R., 1987 - 101. Tethinidae. In: MCALPINE J.F., ed., *Manual of Nearctic Diptera*, 2: 1073-1078. Ottawa: Research Branch, Agriculture Canada, Monograph 28, pages iv+675-1332.
- VOCKEROTH J.R., 1995 - Validation of *nomina nuda* of Nearctic Tethinidae, Scathophagidae, and Muscidae proposed in *Manual of Nearctic Diptera*. *Proceedings of the Entomological Society of Washington*, 97(3): 732-734.
- WILLISTON S.W., 1893 - List of Diptera of the Death Valley Expedition. *North American Fauna*, 7: 253-259.
- WILLISTON S.W., 1896 - XI. On the Diptera of St. Vincent (West Indies). *Transactions of the Entomological Society of London*, 3: 253-446.
- WIRTH W.W., 1956 - Two new Neotropical species of surf flies of the genus *Canace* (Diptera, Canaceidae). *Revista Brasileira Entomologica*, 5: 161-165.

APPENDIX

World distribution of genera and species cited in the text

Note: the concept of the Afrotropical Region adopted here follows the forthcoming *Manual of Afrotropical Diptera*, in including the modern states of Yemen, Oman and the United Arab Emirates.

List of genera and species ordered alphabetically

Afrotethina kaplanae Munari, 1994

Afrotropical: Cameroon, Sierra Leone.

Dasyrhicnoessa adelpha Munari, 2005

Oriental: India (Goa).

Dasyrhicnoessa ciliata Munari, 2004

Australasian/Oceanian: Australia (Northern Territory).

Dasyrhicnoessa fulva (Hendel, 1913)

Australasian/Oceanian: Hawaii (Maui, Oahu).

Oriental: Sri Lanka, Taiwan.

Afrotropical: Oman, United Arab Emirates.

Dasyrhicnoessa insularis (Aldrich, 1931)

Afrotropical: Cameroon, Madagascar, Nigeria, Sierra Leone.

Australasian/Oceanian: American Samoa (Tutuila), Australia (Queensland), Bismarck Islands (Dyaul), Canton Island, Caroline Islands (Ponhpei, Chuuk, Yap, Palau), Fiji Islands (Ovalau, Suva, Viti Levu), ?French Polynesia (Society Islands: Moorea), Hawaii (French Frigate Shoals, Hawaii, Hilo, Kahoolawe, Kauai, Lisiansky, Maui, Midway Atoll, Molokai, Oahu, Pearl and Hermes Reef), Kiribati (Butaritari, Makin, Eita, Tarawa, Abemama), Line Islands (Christmas), Mariana Islands (Saipan, Tinian), Marquesas (Hivaoa, Nuku Hiva), Marshall Islands (Majuro, Japtan, Parry, Lib, Jibu, Jaluit, Namorik), New Hebrides (Erromanga), Palmyra Island, Pitcairn Island, Rapa Island, Society Islands (Bora Bora), Wake Island.

Nearctic: Bermuda, United States (Florida).

Neotropical: Bahamas (South Bimini), Belize, Brazil (Ceará, Paraná, São Paulo), Mexico (Tabasco), West Indies (Cuba, Dominica, St. Kitts, St. Lucia, St. Vincent).

Dasyrhicnoessa macalpinei Munari, 2004

Australasian/Oceanian: Australia (Northern Territory).

Dasyrhicnoessa vockerothi Hardy and Delfinado, 1980

Afrotropical: Seychelles (Aldabra, Astove, Mahé).

Australasian/Oceanian: Australia (New South Wales, Northern Territory, Queensland), Bismarck Islands (Dyaul), Caroline Islands (Truk, Palau), Gilbert Islands, Hawaii (Hawaii, Hilo, Kauai, Maui, Molokai, Oahu), Mariana Islands (Guam, Saipan), Marshall Islands, ?New Caledonia, Papua New Guinea, Wake Island.

Oriental: Japan (Ryukyu Islands), Malaysia (Sarawak), Philippines, Sri Lanka.

Horaismoptera hennigi Sabrosky, 1978

Oriental: Sri Lanka.

Pelomyiella mallochi (Sturtevant, 1923)

Nearctic: Canada (British Columbia, Manitoba, Northwest Territories, Saskatchewan), Greenland, Mexico (Baja California Norte), United States (Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Idaho, Kansas, Maine, Maryland, Massachusetts, Michigan, Montana, Nevada, New York, North Dakota, Oregon, Rhode Island, South Dakota, Texas, Utah, Virginia, Washington, Wyoming).

Palaeartic: Austria, Belgium, Bulgaria, China (Tibet), Czech Republic, Denmark, England, France, Germany, Greece, Hungary, Italy (incl. Sardinia), Mongolia, Netherlands, Poland, Romania, Russia (including Arctic territories), Slovakia, Spain, Sweden, Turkey, Ukraine, former Yugoslavia.

Plesioteethina australis Munari, 2000

Australasian/Oceanian: Australia (Western Australia).

Pseudorhicnoessa rattii Munari, 1981b

Afrotropical: Mauritius, Seychelles (Cousine, Mahé).

Oriental: India (Goa), Sri Lanka.

Pseudorhicnoessa spinipes Malloch, 1914

Australasian/Oceanian: Australia (Northern Territory, Queensland), Bismarck Islands (Duke of York, Dyaul, Hermit, Lavongai, Manus), Caroline Islands (Palau, Tobi, Yap), Mariana Islands (Guam, Saipan), Marshall Islands (Alu, Likiep, Majuro), Papua New Guinea.

Oriental: Japan (Ryukyu Islands), Malaysia (Sabah, Sarawak, Singapore), Philippines, Taiwan, Thailand, Vietnam.

Sigaloethina phaia Munari, 2004

Australasian/Oceanian: Australia (New South Wales, Northern Territory, Queensland).

Tethina albitarsa Foster and Mathis, 1998

Neotropical: Ecuador, Panama.

Tethina alboguttata (Strobl, 1900)

Afrotropical: St. Helena.

Palaeartic: Algeria, Canary Islands, Morocco, Portugal (Madeira), Spain (including Balearic Islands), Tunisia.

Tethina albosetulosa (Strobl, 1900)

Afrotropical: Senegal.

Palaeartic: Azores, Belgium, Bulgaria, Canary Islands, Cyprus, Denmark, Egypt, England, France, Germany, Greece, Hungary, Israel, Italy (incl. Sardinia), Lebanon, Malta, Portugal, Romania, Spain (including Balearic Islands), Tunisia, Turkey.

Tethina albula (Loew, 1869)

Australasian/Oceanian: Hawaii (Hawaii, Kahoolawe, Kauai, Maui, Oahu).

Nearctic: United States (California, Delaware, Florida, Maryland, Massachusetts, New York, North Carolina, Rhode Island, South Carolina, Virginia).

Neotropical: Bahamas, Belize, Brazil (Rio de Janeiro), Costa Rica, Curaçao, Ecuador (incl. Galápagos Islands), Guyana, Mexico (Baja California Sur, Chiapas, Quintana Roo, Sonora), Panama, Peru, West Indies (Anguilla, Antigua, Barbados, Barbuda, Dominica, Dominican Republic, Grand Cayman, Grenada, Jamaica, Montserrat, Puerto Rico, St. Croix, St. Lucia, St. Vincent, Trinidad and Tobago, Turks and Caicos).

Tethina amphitrite Munari and Báez, 2000

Afrotropical: Cape Verde Islands.

Tethina brasiliensis Prado and Tavares, 1966

Neotropical: Brazil (Bahia, Rio de Janeiro, Rio Grande do Norte, Santa Catarina, São Paulo).

Tethina grossipes (Becker, 1908)

Afrotropical: Cape Verde Islands.

Palaeartic: Canary Islands, Morocco.

Tethina hirsuta Munari, 2000

Australasian/Oceanian: Australia (Western Australia).

Tethina insulans Curran, 1932

Neotropical: Ecuador (Galápagos Islands).

Tethina pallidiseta Malloch, 1935

Australasian/Oceanian: Australia (Lord Howe Island, New South Wales, Tasmania, Victoria, Western Australia).

Tethina pallipes (Loew, 1865)

Afrotropical: Cape Verde Islands, Oman, Senegal, Seychelles (Aldabra), South Africa, United Arab Emirates.

Australasian/Oceanian: Australia (Western Australia); Hawaii (Lanai, Oahu).

Oriental: India, Taiwan.

Nearctic: Bermuda, United States (Texas).

Neotropical: Chile, Mexico (Chiapas, Tabasco).

Palaeartic: Algeria, Azores, Bulgaria, Canary Islands, Cyprus, Egypt, France, Greece, Israel, Italy, Jordan, Malta, Portugal (Madeira), Spain (including Balearic Islands), Tunisia, Turkey.

Tethina robusta Foster and Mathis, 2000

Neotropical: Chile.

Tethina soikai Munari, 1981a

Afrotropical: Cape Verde Islands, Oman, Senegal.

Tethina spinulosa Cole, 1923

Nearctic: Mexico (Baja California Norte), United States (California, Florida).

Neotropical: Chile (Tarapaea to Antofagasta), Ecuador (Galápagos Islands), Mexico (Baja California Sur, Sonora, Tabasco).

Tethina thula Sasakawa, 1986

Nearctic: United States (Alaska).

Palaeartic: Japan (Chishima Islands, Hokkaido), Russia (Far East, South Sakhalin).

Tethina willistoni (Melander, 1913)

Australasian/Oceanian: Hawaii (French Frigate Shoals, Hawaii, Kahoolawe, Kauai, Lisiansky, Maui, Oahu), Midway Islands.

Nearctic: Bermuda, United States (California, Connecticut, Delaware, Florida, Maryland, Massachusetts, North Carolina, South Carolina, Virginia).

Neotropical: Bahamas, Belize, Brazil (Paraná, Rio de Janeiro, Santa Catarina, São Paulo), Cuba, Curaçao, Ecuador, Mexico (Chihuahua, Tabasco), Panama, Peru, Tobago, Turks and Caicos, West Indies (Anguilla, Antigua, Barbados, Barbuda, Dominica, Dominican Republic, Grand Cayman, Grenada, Guadeloupe, Jamaica, Montserrat, Puerto Rico, St. Croix, St. Lucia, St. Vincent).

Tethina xanthopoda (Williston, 1896)

Nearctic: Bermuda, United States (Alabama, Florida).

Neotropical: Bahamas, Belize, Guyana, Mexico (Quintana Roo, Yucatan), Panama, Trinidad and Tobago, Turks and Caicos, West Indies (Antigua, Barbados, Barbuda, Cuba, Curaçao, Dominica, Dominican Republic, Grand Cayman, Grenada, Guadeloupe, Jamaica, St. Lucia, St. Vincent).

Thitena cadaverina Munari, 2004

Australasian/Oceanian: Australia (Western Australia).

Enrico RICCHIARDI* - Sha LI**

Annotated checklist of Chinese mainland *Dasyvalgus*, with description of nine new species

(Coleoptera Scarabaeidae Cetoniinae)

Riassunto: Checklist commentata delle specie cinesi del genere *Dasyvalgus*, con descrizione di nove nuove specie (Coleoptera Scarabaeidae Cetoniinae).

Il genere *Dasyvalgus* Kolbe, 1904, è, tra i Valgina, quello che include il maggior numero di specie. In Cina, prima di questo studio, era rappresentato da sole cinque specie. Nove nuove specie (*Dasyvalgus becvariensis* Ricchiardi n.sp., *Dasyvalgus benesi* Ricchiardi n.sp., *Dasyvalgus lighthbrowni* Ricchiardi n.sp., *Dasyvalgus minutus* Ricchiardi n.sp., *Dasyvalgus motuoensis* Ricchiardi n.sp., *Dasyvalgus paratomentatus* Ricchiardi n.sp., *Dasyvalgus rufipes* Ricchiardi n.sp., *Dasyvalgus tomentatus* Ricchiardi n.sp., *Dasyvalgus varius* Ricchiardi n.sp.) sono ora descritte e documentate. Includendo queste nuove specie, nuove sinonimie e segnalazioni il genere *Dasyvalgus* è ora rappresentato in Cina (a esclusione di Taiwan) da diciassette specie. Inoltre le femmine di cinque di esse sono descritte o illustrate ed è fornita una chiave dicotomica utile alla determinazione dei maschi.

Abstract: The genus *Dasyvalgus*, is the largest of Valgina and in mainland China was previously represented by five species only. Nine new species (*D. becvariensis*, *D. benesi*, *D. lighthbrowni*, *D. minutus*, *D. motuoensis*, *D. paratomentatus*, *D. rufipes*, *D. tomentatus*, *D. varius*) are here described and illustrated. Including the new species, new synonymies and new records, presented here, the mainland Chinese *Dasyvalgus* now consists of seventeen species. Moreover, the females of five species are described or illustrated, and a key for the identification of the males is provided.

Key words: Coleoptera, Valgina, *Dasyvalgus*, new species, new synonyms.

INTRODUCTION

Until recently the known Chinese mainland species of *Dasyvalgus* Kolbe, 1904 numbered only five, most of them inhabiting the provinces of the Southeast: these were *D. ichangicus* (Moser, 1915), *D. laligantii* (Fairmaire, 1888), *D. sebastiani* Endrödi, 1952 and *D. sommershofi* Endrödi, 1952. A fifth species, *Dasyvalgus sellatus* (Kraatz, 1883) was added by Krajcik (2011) on the basis of a specimen from Hong Kong identified by Kraatz; however, Kraatz had misidentified the specimen and *D. sellatus* in reality is actually not part of the Chinese fauna (see discussion under Taxonomy section below). Recently, another species, *D. rugosus* Ricchiardi 2013, was added to the list of those occurring in China.

The study of many specimens of *Dasyvalgus* I have accumulated over the years, mainly caught in the

1990s by many eastern European entomologists, of more recent by local collectors, and with the study of IZAS collection (Beijing) made by Sha Li, has led to the identification of nine new species. With the decision to place *D. sebastiani* Endrödi, 1952 as junior synonym to *D. inouei* Sawada, 1939 (new jun. syn.) and three new records for China - *Dasyvalgus carbonarius* (Arrow, 1910), *Dasyvalgus montivagus*, (Moser, 1915) and *Dasyvalgus penicillatus* (Blanchard, 1850), the total number of Chinese *Dasyvalgus* rises to seventeen.

Given the great variety of biotopes and the vastness of the country, future research will undoubtedly lead to the discovery of new species and to a better knowledge of their ecology and distribution. The current paper will, hopefully, provide a good foundation for future studies.

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Dasyvalgus is the largest genus within *Valgina*, and currently comprise about 136 species (including those described or synonymised here), but many others are awaiting description and the total number may rise over 150.

Dasyvalgus is a genus of *Valgina* belonging to the Oriental Region fauna. The distribution of the species is bounded on the north by a line that extends from the southern Himalayan sub-region to the centre of Japan, excluding Korea. The southern boundary is formed by a line that extends from Sri Lanka to Lombok, Sulawesi and the Moluccas. Some species is present in the Chinese Transition Zone (Zona di Transizione Cinese, *sensu* Palestini *et al.*, 1985) where the Palaearctic and Oriental fauna are simultaneously present (Ling *et al.*, 2008). One species, *Dasyvalgus tuberculatus* (Lewis, 1887) inhabits the south-central region of the Japan mainland, part of the Palaearctic region. Oddly, one species, *Dasyvalgus mexicanus* (Cazier, 1937), lives in Mexico and was recently included in the genus (Jameson *et al.*, 2005). Actually, the morphological analysis of this species support its inclusion in *Dasyvalgus*. However, it is possible that the finding of the female, currently unknown, or a genetic study comparing this species with Chinese's counterpart could lead to a different diagnosis.

Females of *Dasyvalgus* are much less often collected than males, but in the case of the Chinese species we already know females for six of them (*D. becvariensis*, *D. benesi*, *D. inouei*, *D. carbonarius*, *D. penicillatus* and *D. sommershofi*), which provides a good insight into their general morphology. They differ from their males counterparts in their size (being wider and longer), in the shape of pronotum (generally more squared anteriorly), sometimes also for the shape of posterior pronotal margin (see *D. penicillatus*), in the shape of propygidium and pygidium, in their enlarged protibiae, and in their shorter suctorial brush.

Five species of *Dasyvalgus* from the mountains of south western China are described below, (*D. benesi*, *D. paratomentatus*, *D. lighthbrowni*, *D. tomentatus* and *D. varius*). In each of these, males are characterized by having four rounded white cretaceous maculae on the pygidium (Fig. 1), a character shared with *D. ovicollis* Arrow, 1910, from Myanmar. One of the Chinese species (*D. lighthbrowni*) actually resembles very similar to *D. ovicollis*, but the parameres are distinctive (Fig. 2j). Moreover, a male of one Vietnamese species, *Dasyvalgus montivagus* Moser, 1915, sharing

the same character, was found on Dayaoshan Mountains (Guangxi, new record for China). See Fig. 3 for distribution of these species.

Although the pattern formed by elytral scales is very similar (Fig. 2), these seven species can be separated by the shape of the parameres (Fig. 2) and other morphological characters highlighted in the descriptions and in the dichotomous key. Contrary to what normally happens in *Dasyvalgus*, these species show a great variability in the shape of their parameters.

Currently, we do not separate them into a defined species group for the following reasons: the only known female (*D. benesi*), herein described, does not have white cretaceous areas or markings on the pygidium; the other morphological characters shared by the six species (for example, the shape and size of the of protibial teeth) are not unique; while sharing pattern of scales on the elytra, this is very similar to that observed in other *Dasyvalgus* species from China (*D. becvariensis*, *D. ichangicus*; Fig. 4a,b,f) and from elsewhere - for instance *D. ovicollis* and *D. tuberculatus* (Lewis, 1887), the latter species from Japan. There is no doubt, however, that these five species are closely related to each other and to *D. montivagus* and *D. ovicollis*.

Three Chinese species, *D. minutus*, *D. motuoensis*, and *D. penicillatus* (Blanchard, 1850) occur in the valleys of south Xizang ending in Arunachal

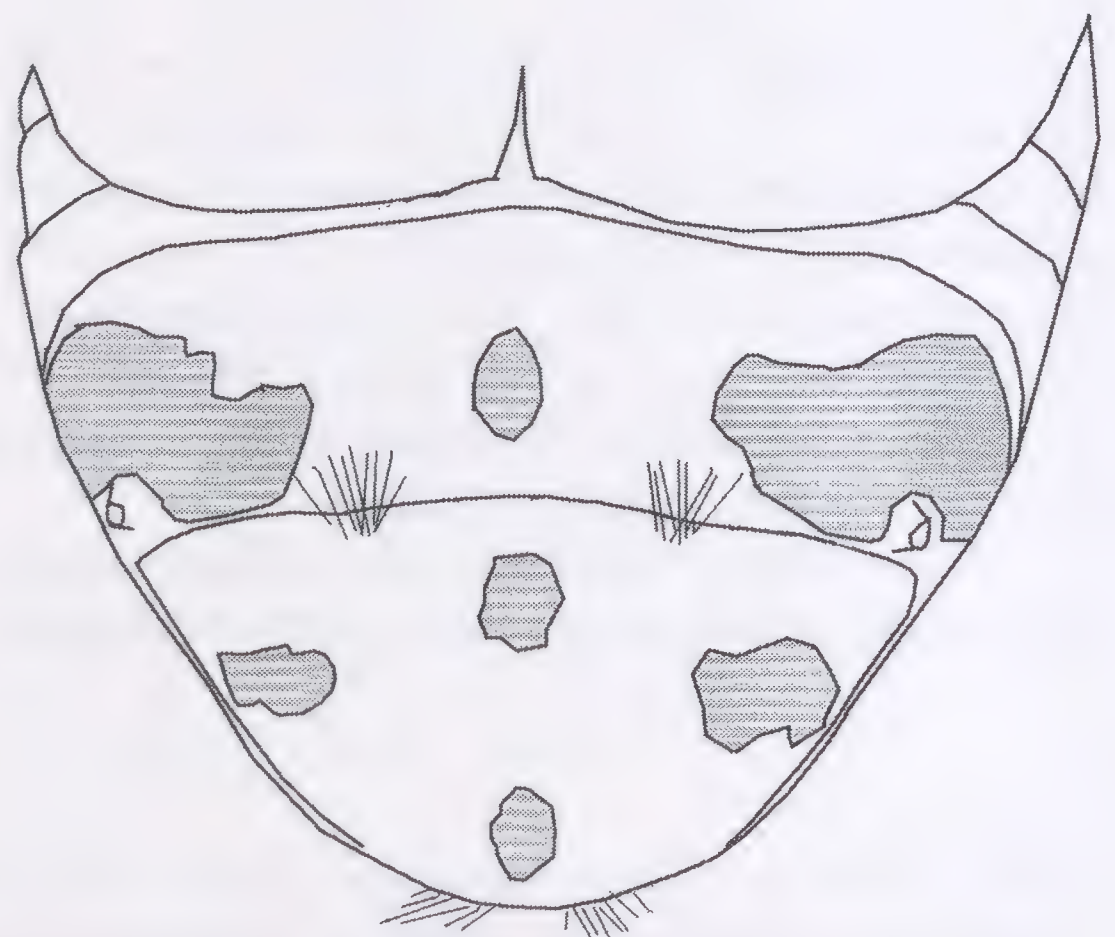


Fig. 1. Propygidium and pygidium of a PT ♂ ERC of *D. lighthbrowni*.

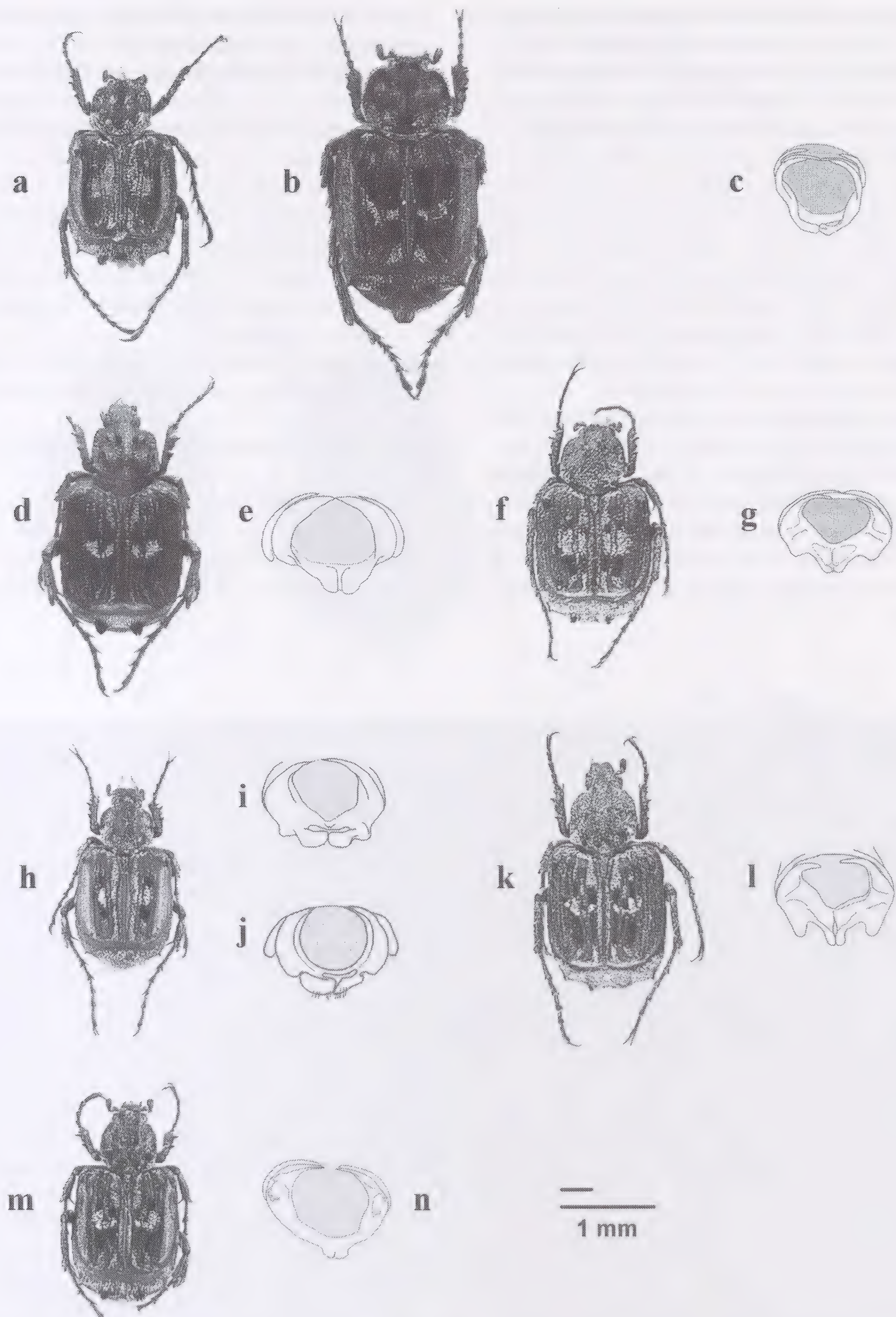


Fig. 2. Habitus and parameres of: a-c – *D. benesi* (a, PT male, b PT female) both ERC; d,e – *D. montivagus*, male ERC; f,g – *D. paratomentatus* HT male IZAS; h,i – *D. lighbrowni* PT male ERC; k,l – *D. tomentatus* HT male IZAS; m, n – *D. varius* PT male ERC; j, parameres of HT male of *D. ovicollis* NHM.

Pradesh, which are associated with north eastern India, southern Himalaya and northern Myanmar.

Of the other Chinese species, it is remarkable that *D. sebastiani* is found to be junior a synonym (syn. nov.) of *D. inouei*, a Taiwan species. To this point in time, six *Dasyvalgus* species have been described from Taiwan (*Dasyvalgus formosanus* Moser, 1915; *D. inouei* Sawada, 1939; *Dasyvalgus makiharai* Miyake, 1985, *Dasyvalgus sauteri* Ricchiardi, 1998; *Dasyvalgus taiwanus* Miyake, 1991 and *Dasyvalgus wadai* Miyake, 1985), one of which also occurs on mainland China. The five endemic Taiwan species of *Dasyvalgus* certainly show the relatively long faunistic isolation of Taiwan from the mainland.

As could be expected, four species are shared with Indochina (*D. carbonarius*, *D. laligantii*, *D. montivagus* with North Vietnam; *D. rufipes*, with Laos) and these could only increase in the future.

The new species and new synonymies are settled by E. Ricchiardi; unless elsewhere specified, all photograph and drawings were made by E. Ricchiardi.

Key to abbreviations of some taxonomical characters and remarks (Fig. 5):

- aut anteapical umbone scale tuft. Rarely absent
- c carina. Can be obsolete or more or less sharp and more or less long; the two carinae maybe parallel or arched outwardly
- cct central carina scale tuft. Sometimes not present
- csc central small carina. Sometimes not present
- cpt carina posterior tuft. The carina not always reach this scale tuft. Sometimes the scale tuft not present
- lsc lateral small carina. More or less long. Sometimes not present
- pat posterior angle scale tuft. Sometimes not present
- pt propygidium scale tuft. Always present, often prominent
- ut humeral umbone scale tuft. Rarely absent.

The following nomenclatural acts are presented herein:

- description of nine new *Dasyvalgus* (new species)
- designation of *Dasyvalgus sebastiani* Endrödi,

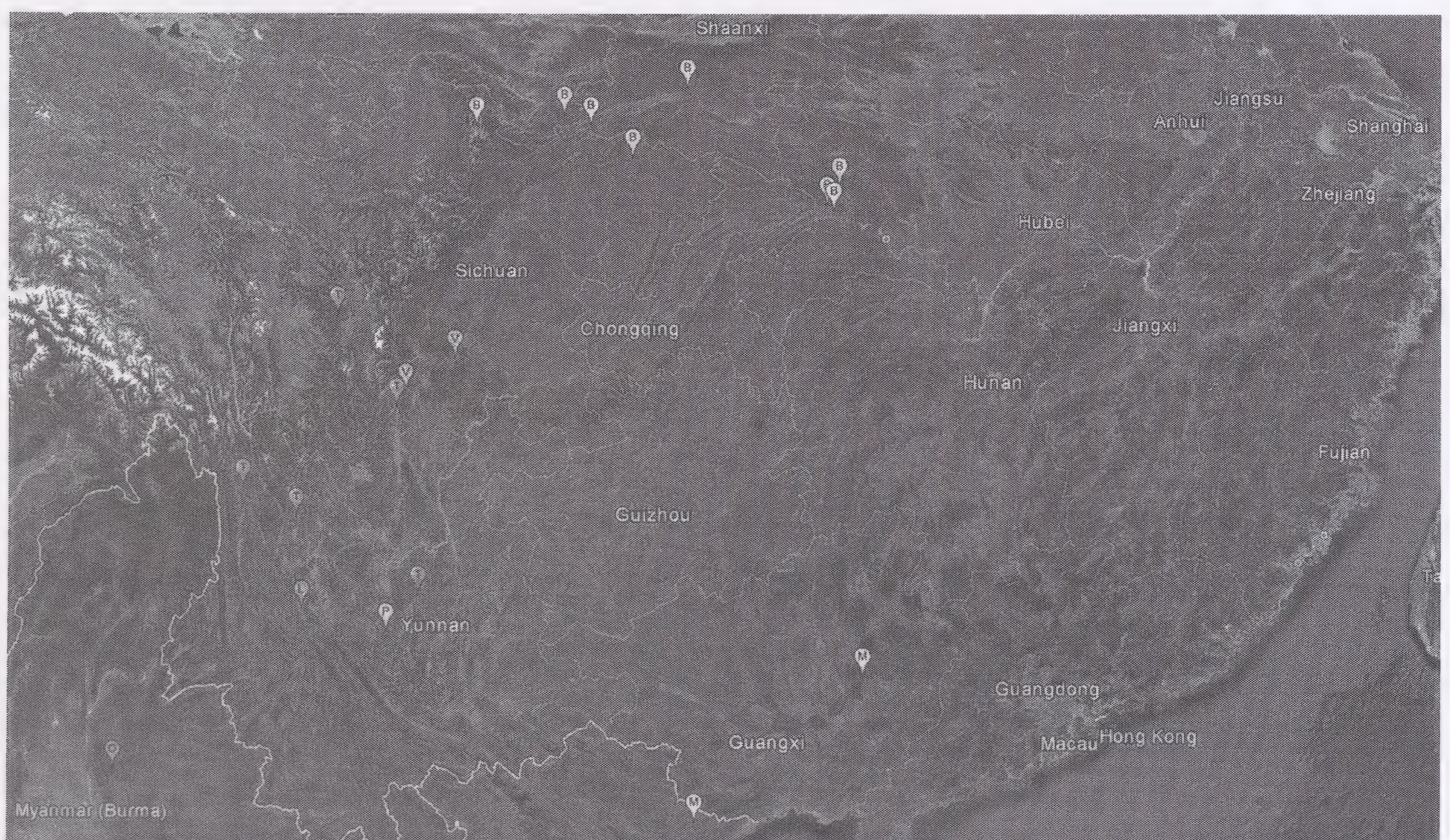


Fig. 3. Distribution of the species with four cretaceous markings on pygidium. B, *D. benesi*; L, *D. lightbrowni*; M, *D. montivagus*; O, *D. ovicollis*; P, *D. paratomentatus*; T, *D. tomentatus*; V, *D. varius*.

- 1952 as junior synonym of *Dasyvalgus inouei* Sawada, 1939 (new synonym)
- designation of type series of *Dasyvalgus laligantii* (Fairmaire, 1888)
- designation of type series of *Dasyvalgus sellatus* (Kraatz, 1883)
- first description of females of *D. becvariensis*, *D. benesi*, and *D. sommershofi*
- new records for China of *D. Carbonarius*, *D. montivagus* and *D. penicillatus*
- designation of type series of *D. montivagus* Moser, 1915.

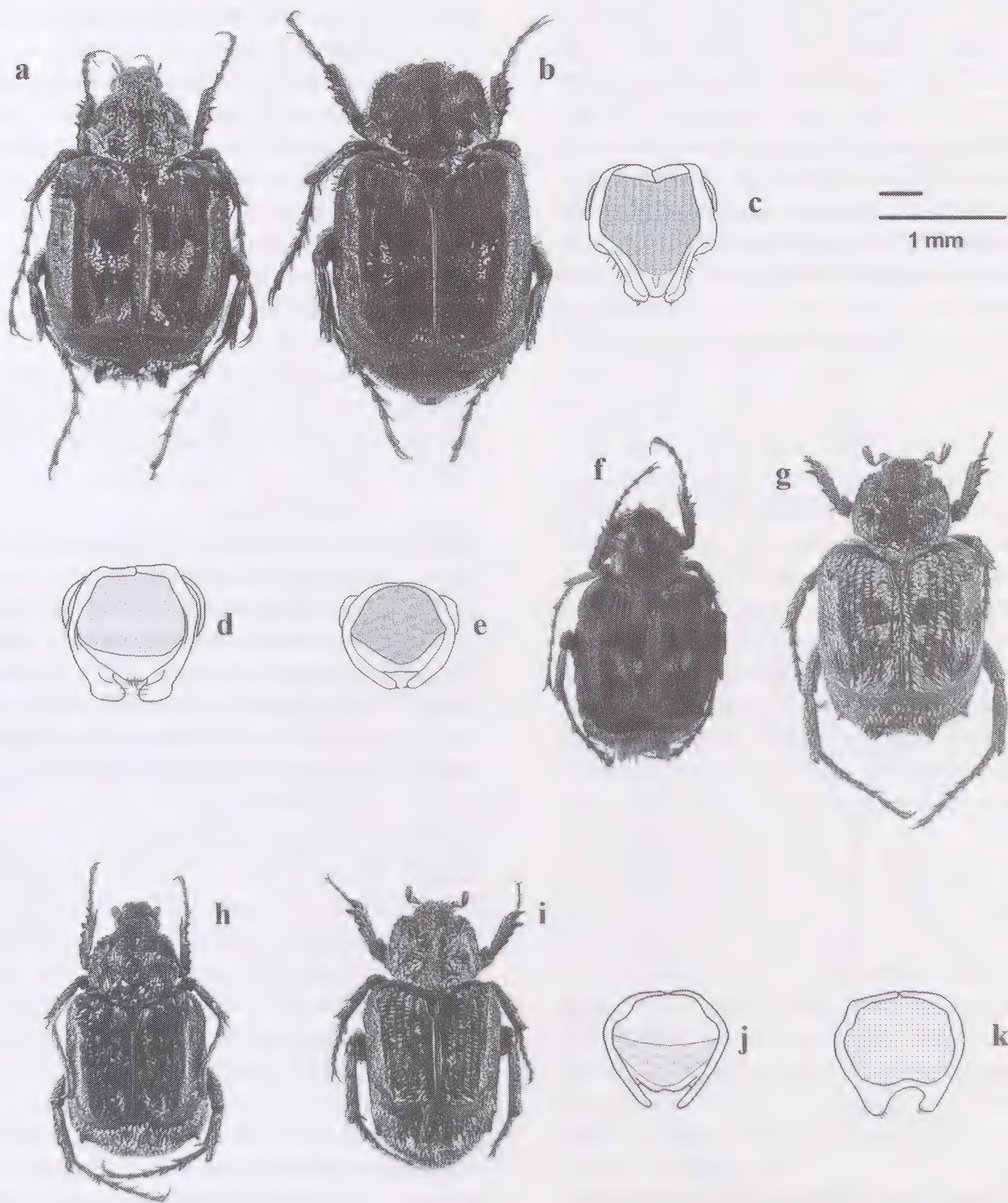


Fig. 4. Habitus and parameres of: a-c – *D. becvariensis* (a, PT male, b, PT female, both ERC); d, f – *D. ichangicus* (HT male MNHUB; photo Sha Li, Beijing); e, g – *D. laligantii*; h-j, *D. sommershofi* (h, male, i, female); k, parameres of *D. sellatus*.

MATERIALS AND METHODS

Most of type specimens of species discussed in this paper were examined and are detailed under the taxonomy section of each species. The total length of a specimen was measured from the anterior margin of the pronotum (because, as already pointed out by Arrow, 1910, pag. 222: *the head of Dasyvalgus, and most Valgina, is capable of being folded closely beneath the sternum, being then concealed from above by the prominent front part of the pronotum*) to the apex of pygidium (excluding the protrusion at apex of pygidium in some females); specimen width is the maximum width of the elytron. Measurements were taken using the millimeter grid of the binocular microscope. Photographs of holotypes were taken with a Nikon Coolpix P7700, attached to one of the eyepieces of a Wild dissecting microscope or with the same camera but without the microscope. Photographs were processed with photo stacking software (Zerene

Stacker - Version 1.04 Build T201411272115, <http://www.zerenesystems.com>). Finally, backgrounds were removed from photos using GIMP 2.8.14, in order to increase clarity.

ABBREVIATIONS USED

Scientific collections:

- ERC Enrico Ricchiardi Collection, Turin, Italy
- AMNH American Museum of Natural History, New York, USA
- HNHM Hungarian Natural History Museum, Budapest, Hungary
- IZAS Institute of Zoology, Chinese Academy of Science, Beijing, China
- MHNG Musée d'Histoire Naturelle, Geneve, Switzerland
- MNHN Museum National d'Histoire Naturelle, Paris, France
- MNHUB Museum für Naturkunde, Berlin, Germany
- MZF Museo Zoologico, La Specola, Florence, Italy
- NHM The Natural History Museum, London, UK
- NHMB Natural History Museum, Basel, Switzerland
- NMER Naturkunde Museum, Erfurt, Germany
- SDEI Deutsche Entomologische Institut Munchberg, Germany
- SNMS Stuttgart Staatliche Museum für Naturkunde, Stuttgart, Germany
- USNM United States National Museum, Smithsonian Institute, Washington DC, USA
- ZMHA Zoological Museum, Halle, Germany
- ZFMK Zoologisches Forschungsinstitut und Museum Alexander König, Bonn, Germany
- ZMUC Zoological Museum University of Copenhagen, Denmark

Types:

- CT Cotypes
- LT Lectotype
- HT Holotype
- NT Neotypes
- PLT Paralectotype
- PT Paratype

SPECIES LIST

<i>becvariensis</i>	Ricchiardi n. sp.	Yunnan, Sichuan
<i>benesi</i>	Ricchiardi n. sp.	Sichuan, Shaanxi, Hubei, Gansu
<i>carbonarius</i>	Arrow, 1910	Nepal, Assam,

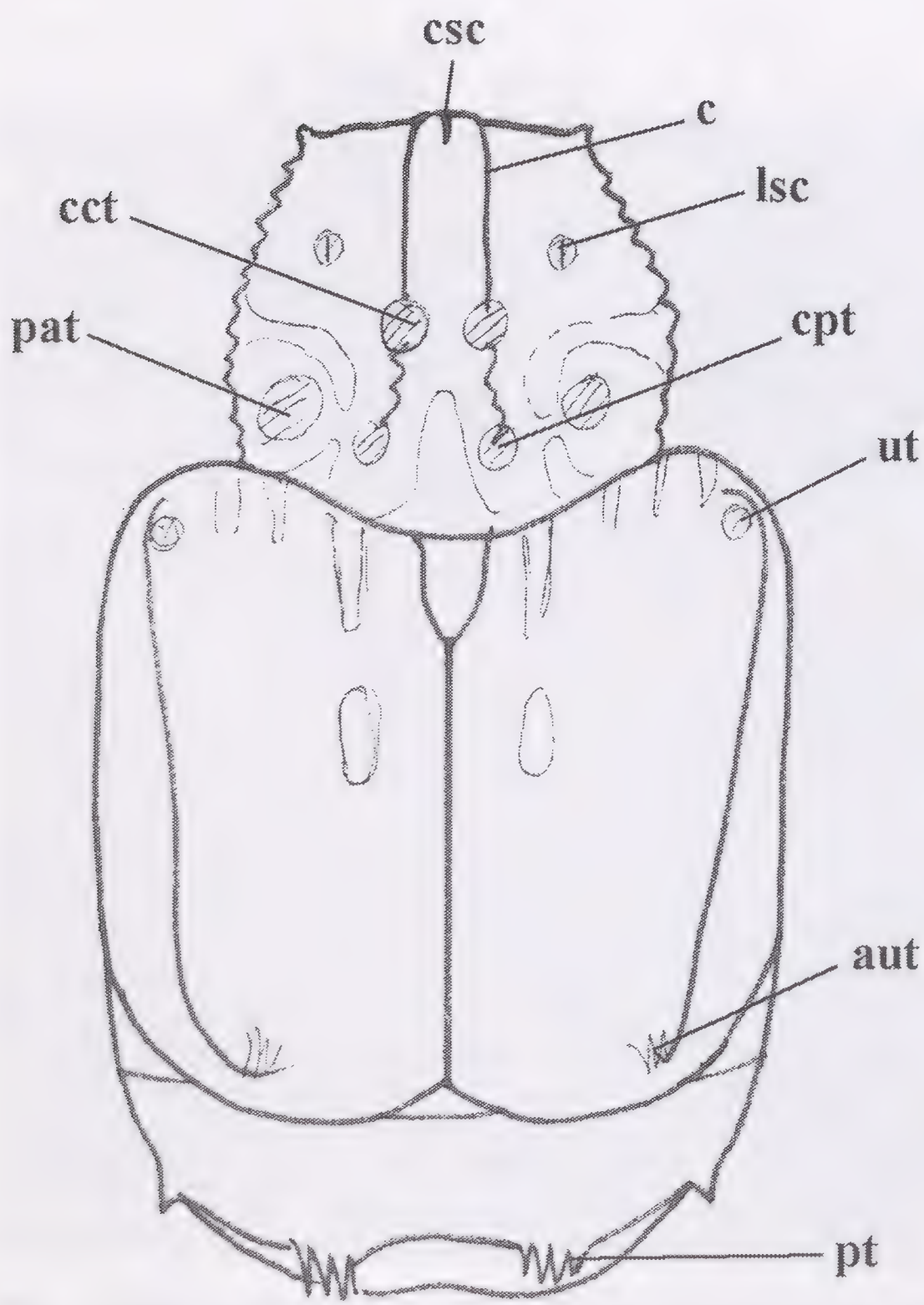


Fig. 5. Some descriptive morphological terms of *Dasyvalgus*.

		Myanmar, Thailand, Laos, Vietnam, Hainan
<i>ichangicus</i>	Moser, 1915	Hubei
<i>inouei</i>	Sawada, 1939	Taiwan, Fujian, Guangxi
= <i>sebastiani</i>	Endrödi, 1952	Fujian
<i>laligantii</i>	(Fairmaire, 1888)	Vietnam, Fujian, Guangxi, Hong Kong
<i>ligthbrowni</i>	Ricchiardi n.sp.	Yunnan
<i>minutus</i>	Ricchiardi n. sp.	Xizang
<i>montivagus</i>	Moser, 1915	Vietnam, Guangxi
<i>motuoensis</i>	Ricchiardi n. sp.	Xizang
<i>aratomentatus</i>	Ricchiardi n. sp.	Yunnan
<i>penicillatus</i>	(Blanchard, 1850)	Nepal, Bhutan, India, Xizang
<i>rufipes</i>		Ricchiardi n. sp. Laos, Guangxi, Hainan
<i>rugosus</i>	Ricchiardi, 2013	Yunnan
<i>sommershofi</i>	Endrödi, 1952	Fujian
<i>tomentatus</i>	Ricchiardi n. sp.	Yunnan, Sichuan
<i>varius</i>	Ricchiardi n. sp.	Sichuan

TAXONOMY

Dasyvalgus becvariensis Ricchiardi n. sp. (Fig. 4a-c).

TYPE SERIES. HT ♂ IZAS, Yunnan, Gongshan County, Danzhu to city (27°41'24"N, 98°39'00"E), 2000 m, Sino-America Expedition, 5 Jul 2000, legit H.B. Liang; 1 PT ♂ IZAS, Yunnan, Deqin, Meili Snow Mountains (28°27'36"N, 98°50'46"E), 3700-4000 m, 29 Jul 1982, leg. Wang Shuyong; 1 PT ♂ IZAS, Yunnan, Deqin, Meili Snow Mountains (28°27'36"N, 98°50'46"E), 3450 m, 29 Jul 1982, leg. Zhang Xuezhong; 1 PT ♂ IZAS, Yunnan, Deqin, Meili Snow Mountains (28°27'36"N, 98°50'46"E), 3200-3500 m, 23 Jul 1982, leg. Wang Shuyong; 1 PT ♂ 1 PT ♀ ERC, China, Yunnan, Heishu, 35 Km North of Lijiang, 18 Jun/4 Aug 1993, S. Bečvář legit; 1 PT ♂ IZAS, Sichuan, Wenchuan, Wolong (31°02'45"N, 103°12'17"E), 25 Jul 1983, leg. Wang Shuyong.

HOLOTYPE DESCRIPTION. Length 6.8 mm, width 4.7 mm.

Head: brown, slightly shiny, covered with large shallow punctures and with testaceous, inclined, bristle like scales that do not form tufts. Clypeus brown, almost glabrous, anteriorly sinuate, covered with same punctuation; suctorial brush longer than clypeal length.

Pronotum: dark brown, laterally and posteriorly brown, covered with recumbent scales which are either testaceous or white; trapezoidal, medially convexly arched; anterior angles acute; posterior angles right angled, with apex pointed; sides crenate; carinae sharp and curved outwardly, ending at centre of disk; without central small carina; lateral small carinae obsolete; small black scales tufts at end of carinae and with mixed black and testaceous scales on lateral small carinae; posterior margin with four prominent testaceous scale tufts, the inner two a bit smaller.

Scutellum: long, approximately triangular, apically obtuse, covered with bristle like, inclined, testaceous and black scales.

Elytra: slightly shiny, mostly glabrous, brown or black in some places, with lateral margins a slightly widened medially; in some places covered with black or testaceous inclined small scales that form a definite pattern (Fig. 4a,b). Humeral umbones well developed, rounded, each covered with a prominent black scale tuft. Anteapical umbones similarly prominent, covered with identical, less developed, black scale tufts.

Propygidium: brown, opaque, mostly glabrous, covered with round, thick, punctuation; with scattered, recumbent, testaceous scales; posterior margin curved inward at the middle, with two prominent tufts made of erect, long, black and testaceous scales; cones sharp.

Pygidium: brown, opaque; covered with dense round punctuation and very scattered, recumbent, testaceous scales; ventral half constricted to apex, laterally narrowed; apex forming a rounded projection on which a double pointed testaceous scale tuft occurs; apex of pygidium curving outward in lateral view.

Protibia: brown, with five external teeth: first three long and pointed, fifth smaller and pointed, fourth large, short and rounded.

Meso and metatibiae: brown, black in some places, centrally enlarged, with noticeable central tooth, and some scattered, long, erect, testaceous scales; first metarsomere about twice as long as second. Abdomen: dark brown, nearly glabrous, with some small, testaceous, recumbent scales on the sternites; anal sternites brown, glabrous, covered with round, shallow, large punctuation.

PARATYPE FEMALE DESCRIPTION. Length 7.0 mm; width 4.1 mm. Body brown.

Head: slightly shiny, covered with large round punctures and with scattered, erect, bristle like testaceous scales that do not form scale tufts on frons. Clypeus

anteriorly sinuate, suctorial brush much shorter than in male.

Pronotum: brown, opaque, trapezoidal, strongly crenate at sides, anterior angles obtuse, posterior angles pointed; posterior margin curved towards scutellum, centrally depressed; carinae outwardly slightly arched, sharp up to centre of disk, rounded posteriorly, ending at 3/4 length of pronotum; central small carina not present; lateral carinae long, sharp; with two testaceous scale tufts present, close to posterior angles; remainder of surface glabrous, with scattered testaceous scales along lateral margins; laterally, the posterior margin with a white, cretaceous area.

Scutellum: black, long, triangular, apically rounded, longitudinally shagreened.

Elytra: brown, in some places black, slightly shiny, mostly glabrous, with shallow juxtascutellar depression; humeral and anteapical umbones slightly elevated, without scale tufts.

Propygidium: brown, slightly shiny, glabrous, covered with dense round punctuation; posterior margin curved inward at the middle, with two small tufts of erect, black scales; cones long and blunt.

Pygidium: brown, slightly shiny, almost glabrous, covered with dense round punctuation; apical half constricted to the apex, the apex forming a rounded projection, wider than that in male; in lateral view, apex of pygidium projecting posteriorly.

Protibiae: brown, with five external teeth: first long and pointed, second and fifth small and blunt, third small and pointed, fourth enlarged and blunt.

Meso and metatibiae: dark brown, centrally enlarged, with several noticeable sharp teeth, and some scattered, long, erect, testaceous scales; metatibial apex enlarged and slightly crenate, dorsal end long and pointed; first metarsomere apically enlarged, about twice as long as second.

Abdomen: brown, nearly glabrous, with some testaceous small, bristle like, erect, testaceous scales on the last two visible sternites; anal sternites brown, glabrous, with a row of small, erect, bristle like, testaceous scales on lateral margins.

DISTRIBUTION. This species looks to be distributed on high mountains between north-west Yunnan to central Sichuan.

TYPE SERIES VARIABILITY. The body of one PT ♂ (ERC) is black instead of brown; its pygidium shows two small, barely noticeable cretaceous markings close to centre of lateral margins.

REMARKS. Females differ from males in their squared pronotum, with lateral margins crenate; for lack of scale tufts on pronotum; for the wider rounded projection at apex of pygidium.

DERIVATIO NOMINIS. The species is dedicated to Stanislav Bečvář who collected the specimens during one of his entomological trips

DIAGNOSIS. This species has the same scale pattern on the elytra as many other Chinese Valgina, but can be separated from them for the pygidium which is mostly glabrous and without any cretaceous areas or markings; moreover, the apex of the pygidium exhibits a prominent rounded projection. The shape of the parameres is also very distinctive (Fig. 4c) in this species.

Dasyvalgus benesi Ricchiardi n. sp. (Fig. 2a-c).

TYPE SERIES. HT ♂ IZAS, China, Shaanxi, Foping, Changjiabaxiang (33°35'22"N, 108°00'35"E), 20 May 2007, Zhang Lijie legit. Paratypes: 1 PT ♂ ERC, Shaanxi, Lueang env. 15 Km NW (33°07'N, 106°07'E), 18/21 Jul 2001, E. Kucera legit; 3 PT ♂ ERC, China, Sichuan, Juzhaigou Songpan Co (County), 3000 m, 4/7 Jul 1994, Beneš legit; 1 PT ♀ SNMS, 1 PT ♀ ERC, Sichuan, Juzhaigou, 2000m, 16 Jun 1992, M. Bok legit; 1 PT ♂ ERC, Sichuan, Shangliang, 24/26 May 2005, E. Kucera legit; 1 PT ♂ ERC, Sichuan, Juizaigou, 13 Jun 2009, E. Kucera legit; 1PT ♂ 1 PT ♀ ERC, same data but 13/19 Jun 2009; 1 PT ♂ ERC, Sichuan, 30 Km W Nanping, Juzhaigou, 2100 m, 11/16 Jun 1992, J. Turna legit; 4 PT ♂ IZAS, Gansu, Kangxian, 17 May 1981, Meng Tienan legit; 6 PT ♂ IZAS, Hubei, Shennongjia, Songbai (31°28'43"N, 110°24'44"E), 900 m, 8 Jun 1981, Hai Yinheng legit; 1 PT ♂ IZAS, Hubei, Shennongjia, Muyuping (31°28'17"N, 110°24'15"E), 1250 m, 4 Jul 1981, Hai Yinheng legit; 1 PT ♂ IZAS, Hubei, Xinshan, Longmen River (31°21'33"N, 110°31'03"E), 1400 m, Sun Baowen legit.

HOLOTYPE DESCRIPTION. Length 5.4 mm, width 3.4 mm.

Head: black, slightly shiny, covered with shallow, large punctures and very scattered, erect, bristle like, testaceous scales not forming tufts; frons with a rounded prominence at centre. Clypeus brown, anteriorly sinuate, covered with same punctuation, almost glabrous; suctorial brush longer than clypeus length.

Pronotum: brown, ovate, medially convexly arcuate; front angles rounded; posterior angles strongly rounded; lateral sides crenate; carinae sharp up to centre of disk,

obtuse afterward, curved outwardly; central small carina not present; lateral small carinae obsolete; covered with very scattered, testaceous, recumbent scales; small black scale tufts at end of carinae; along posterior margin four testaceous scale tufts, the outer two prominent, the inner two barely noticeable.

Scutellum: long, approximately triangular, apically rounded, covered with recumbent, testaceous scales.

Elytra: slightly shiny, mostly glabrous, in some places brown or black, with lateral margins a bit widened outwardly; in some places covered with black, white or testaceous inclined small scales forming a definite pattern (Fig. 2a); humeral umbones rounded and prominent, with black scale tufts; anteapical umbones rounded and prominent, with black/testaceous scale tufts.

Propygidium: brown, slightly shiny, glabrous in some places, with dense, recumbent, testaceous scales elsewhere; posterior margin curved inward at the middle, with two black/testaceous scale tufts; cones sharp; rounded, white cretaceous areas at centre and laterally, close to the cones.

Pygidium: brown, slightly shiny, covered with shallow, rounded, dense punctuation; glabrous in some places and with scattered, recumbent, testaceous scales elsewhere; close to centre of lateral margins there are rounded white cretaceous area; two smaller similar areas are present in the centre of superior margin and close to the apex (Fig. 1); ventral half restricted to apex, laterally narrowed; a double pointed small, testaceous scale tuft at apex; apex of pygidium curves outward in lateral view.

Protibiae: brown, with five external teeth: first two long and pointed, third large, fourth, short and very close to the third, barely noticeable, fifth slightly smaller and pointed.

Meso and metatibiae: dark brown, centrally slightly enlarged, with noticeable central tooth, and some scattered, long, erect, testaceous scales; first metarsomere about twice as long as second.

Abdomen: brown, almost glabrous, with some testaceous, small, erect scales.

PARATYPE FEMALE DESCRIPTION. Length 7.3 mm; width 4.2 mm. Body black.

Head: black, slightly shiny, covered with round, large punctures and very scattered, erect, bristle like, testaceous scales not forming scale tufts on frons. Clypeus black, anterior margin brown and sinuate, suctorial brush shorter than in the male.

Pronotum: black, slightly shiny, glabrous, ovate but less

elongated than in male, strongly crenate at sides; anterior angles obtuse; posterior angles strongly rounded; posterior margin curved towards scutellum, centrally bent downward; carinae outwardly slightly arched, sharp up to centre of disk, rounded afterward, ending at 3/4 of pronotal length; there are small, black scale tuft at centre of length; central small carina not present; lateral carinae long, sharp; on lateral small carinae there are not scale tufts; four brown to black scale tufts along posterior margin, the inner two smaller than outer; remainder of surface nearly glabrous with very scattered, dark testaceous scales; small white, cretaceous areas on outer parts of posterior margin.

Scutellum: black, long, triangular, apically rounded, covered with decumbent black and brown scales.

Elytra: black, covered with decumbent, in some places inclined, black, white and testaceous scales forming a definite pattern (Fig. 2b); presence of shallow juxtascutellar depression; humeral and anteapical umbones slightly elevated, the first with a prominent black scale tuft, the second with identical scale tuft but smaller.

Propygidium: black, slightly shiny, mostly glabrous, covered with round, shallow, dense, punctuation; small, decumbent, testaceous scales present in some places; posterior margin curved inward at the middle, with two small tufts made of erect, black scales; cones long and blunt.

Pygidium: black, slightly shiny, almost glabrous, covered with round, dense, thick, punctuation; ventral half restricted to apex, laterally narrowed; apex forming a rounded bilobed projection, wider than in male; apex of pygidium, prominently curving outward in lateral view.

Protibiae: brown, with five external teeth: first and third long and pointed, second and fifth small and pointed, fourth enlarged and blunt.

Meso and metatibiae: black, centrally enlarged, with prominent, four teeth at centre and some scattered, long, erect, testaceous scales; metatibia apex enlarged and slightly crenate, dorsal end long and pointed; first metarsomere apically enlarged and about twice as long as second.

Abdomen: black, almost glabrous, with some erect, testaceous setae at centre of last two visible sternites; anal sternites black, glabrous, with row of small, erect, testaceous setae on posterior margin.

REMARKS. Females can be distinguished from males for the squared pronotal shape, with lateral margins crenate, for the lack of scale tufts on carinae and small

carinae of pronotum and for the bigger rounded projection at the apex of pygidium.

TYPE SERIES VARIABILITY. Size of males are variable as dimension, ranging from 5.6 in 6.0 mm in length. The two PT ♀ are about of the same dimensions: 7.9-4.5 and 8.0-4.5 mm. Males can have the posterior margin of propygidium scale tufts made up of mixed black/testaceous or wholly black scales and the humeral hum-bones scales tuft testaceous instead of black.

DISTRIBUTION. The type series was collected in Shaanxi, Sichuan, Gansu and Hubei.

DIAGNOSIS. *D. benesi* can be distinguished from the other Chinese species for the four showy white cretaceous areas on pygidium. From the other species with same cretaceous areas it can be separated for having a scaly propygidium and pygidium, for the posterior corners of pronotum strongly rounded, for apex of pronotum bent apart (in lateral view). Furthermore, the shape of its parameres (Fig. 2c) is very distinctive.

DERIVATIO NOMINIS. The species is named after the Czech Entomologist J. Beneš, who collected some of the types.

***Dasyvalgus carbonarius* Arrow, 1910 (Fig. 6f-h).**

STUDIED MATERIAL. 4 ♂ ERC, Hainan, Sanya County, Mt. Janfeng, 1/12 Jul 2004; 1 ♂ ERC, Hainan, Wuzhishan, 1 Jun 2009. New record for China.

DISTRIBUTION. The presence of *D. carbonarius* in Hainan extends the range of this widely distributed species (Ricchiardi 2013), known from east Nepal, Assam, Myanmar, north east Laos, and north Vietnam.

REMARKS. *D. carbonarius* can easily be distinguished by most of the Chinese species for its black, shiny colour. The only other Chinese species completely black, *D. minutus*, from Xizang, is much smaller and opaque, rather than shining. The parameres, too, are very distinctive.

***Dasyvalgus ichangicus* Moser, 1915 (Fig. 4d,f)**

STUDIED MATERIALS. Holotype ♂ MNHUB, China, Ichang, 6000-8000 feet.

REMARKS. This Chinese species, described a century ago by Moser, is still only known from the HT. It lacks the four cretaceous areas on the pygidium. The propygidium is black, but with reddish cones; the pygidium is also black. Both propygidium and pygidium are covered with dense, erect, c-shaped, testaceous scales; at the propygidium posterior margin there are two very

prominent testaceous scale tufts. Finally the parameres are very distinctive. The female is unknown.

***Dasyvalgus inouei* Sawada, 1939 (Fig. 6a-c).**

= *Dasyvalgus sebastiani* Endrödi, 1952, syn. nov.

STUDIED MATERIAL. 3 ♂ MHNG 2 ♂ ERC, Taiwan, Fenchiu, 1400 m, Apr/Jun 1977, J. & S. Klapperich legit; 4 ♂ DAC, Taiwan, Nan Tou Co, Bei Dong Yen Shan, 1700 m, 1 Jun 1991, C.I. Li Legit; 3 ♂ GMC 1 ♂ ERC, Taiwan, Puli, Whuse, May/Jun 1995; 1 ♂ ERC, Taiwan, Puli, Hori, May/Jul 1959; 1 ♂ ERC, Taiwan, Wushai, May 1961; 1 ♂ ERC, Taiwan, Musha, May/Jun 1960.

Moreover several types of *D. sebastiani* Endrödi, 1952, described from Fujian: 1 PT ♂ HNHM, Fujian, Shaowu, 27 Jun 1937, J. Klapperich legit; 21 PT ♂ SNMS, Fujian, Kuatun, 20 May 1946, Tschung Sen legit; 42 PT ♂, Fujian, Kuatun, 20 May 1946, Tschung Sen legit; 1 PT ♀ ERC, Fujian, Kwangtseh, 30 Mar 1937, J. Klapperich legit; 1 PT ♂ ERC, Fujian, Kuatun, 26 Aug 1946, Tchung Sen legit; 1 PT ♂ ERC, Kuatun, 20 May 1946, Tchung Sen legit; 1 PT ♂ ERC, Fujian, Kuatun, 19 Jun 1946, Tchung Sen legit.

OTHER STUDIES (some of them most likely PT, but are not labelled as such). 2 ♂ AMNH, Fujian, Yen-Ping, Ac 5148; 2/29 Jul 1917; 13 ♂ HNHM, Fujian, Kuatun, 20 May 1946, Tchung Sen legit; 1 ♂ HNHM, Fujian, Kuatun, 15 Jul 1946, Tchung Sen legit; 1 ♂ HNHM, Fujian, Kuatun, 6 Jun 1946, Tchung Sen legit; 1 ♂ HNHM, Fujian, Kuatun, 15 Aug 1946, Tchung Sen legit; 71 ♂ ZFMK, Fujian, Kuatun, 27°40'N, 114°40'E, 2300 m, 10 Aug 1938, J. Klapperich legit; 2 ♂ ERC, Fujian, Kuatun, 3 Aug 1946, Tchung Sen legit; 2 ♂ ERC, Fujian, Kuatun, 27°40'N, 114°40'E, 2300 m, 10 Aug 1938, J. Klapperich legit; 1 ♂ ERC, Fujian, Kuatun, 15 Aug 1946, Tchung Sen legit; 2 ♂ ERC, Fujian, Kuatun, 20 May 1946 Tchung Sen legit; Guangxi, 1 ♂ ERC, Mt. Dayaoshan, Lingxian, Jinxiu, 25 apr/5 May 2014, 700 m, HuangYuanyong & Lidong legit.

DIAGNOSIS. The study of all the above mentioned material indicates that *D. sebastiani* Endrödi, 1952 is junior synonym of *D. inouei* Sawada, 1939.

The location of some CT of *D. inouei* is uncertain: while the three ♂ preserved in the Entomological Laboratory of the Tokyo Agricultural University were most likely destroyed during the Second World War, the actual location of the other two CT ♂, formerly in the Hyarayama's Collection, is unknown, thus preventing their designation as NT's.

DISTRIBUTION. This species is known from Fujian, Guangxi and Taiwan.

REMARKS. The female was described by Endrödi, 1952. The author in the same work defined an ab. *dolorosus* based on two PT ♂, with the abdomen completely black, but I have not seen such specimens. *D. inouei* can be distinguished from most of the other

Chinese *Dasyvalgus* as it is almost completely black and glabrous; from *D. minutus* and *D. carbonarius*, for its red propygidium and pygidium. The fifth visible sternites and the anal one too are reddish. Some specimen show a black propygidium and darker sternites.

Dasyvalgus laligantii (Fairmaire, 1888) (Fig. 4g,e).



Fig. 6. Habitus and parameres of: a-c, *D. inouei* (a, male, b, female); d,e – *D. rufipes* (HT male IZAS); f-h – *D. carbonarius* (f, male, g, female); i,j – *D. rugosus* (HT male, from Ricchiardi, 2013).

Dasyvalgus taiwanus Miyake, 1991 (nec *Dasyvalgus similis* Miyake, 1985).

TYPE SERIES. LT ♂, here designated, MNHN (ex Coll. Léon Fairmaire), Vietnam, Tonkin.

Chinese studied material: 1 ♂ ANMH, China, Fujian, Yen-Ping (Yanping), 12 Sep 1917; 1 ♂ SDEI, China, Hong Kong (Coll. Kraatz); 1 ♂ ERC, China, Fujian, Shaowu, 500 m, 10 May 1937, legit J. Klapperich; 1 ♂ ERC, China, Guangxi, Yangshuo, 14 Jul 1990, R. Dunda legit; 1 ♂ ERC, China (without detailed locality); 4 ♂ ERC, China, Guangxi, Mt. Dayaoshan, Lingxian, Jinxiu, 25 apr/5 May 2014, 700 m, HuangYuanyong & Lidong legit.

DISTRIBUTION. North Vietnam (locus typicus), Fujian, Hong Kong, Guangxi.

Dasyvalgus ligthbrowni Ricchiardi n. sp. (Fig. 2h,i).

TYPE SERIES. HT ♂ NHMB, Yunnan, Dali (25°36'N, 100°16'E), 1600-2000 m, 5/8 Jul 1990, L. & M. Bokák; 6 PT ♂ NHMB 3 PT ♂ ERC 1 PT ♂ IZAS, same data as the holotype; 1 PT ♂ SNMS, Yunnan, above Dali, 2000-2200 m, 4/17 Apr 1999, legit W. Schawaller; 2 PT ♂ ERC, Yunnan, Dali, 1600 – 2000 m, 1/7 Jun 1994, legit B. Šiška & T. Spevār.

STUDIED TYPES OF *D. OVICOLLIS* ARROW, 1910. HT ♂ NHM, Myanmar, Birmah, Ruby Mines, Doherty; 2 PT ♂, NHM; H.^{1c} Birmanie, Mines des Ruby, 1200-2300 m, 1890, Doherty.

HOLOTYPE DESCRIPTION. Length 5.1 mm, width 3.2 mm. Body light brown with head, scutellum, femurs and prosternum darkened.

Head: slightly shiny, covered with shallow, large punctures; posteriorly covered with erected testaceous scales not forming scale tufts on frons. Clypeus brown, shiny, anterior margin sinuate, covered with same punctuation as head, almost glabrous; suctorial brush longer than clypeus length.

Pronotum: ovate; covered with, in some places dense, elsewhere scattered, testaceous, recumbent scales; anterior angles acute; posterior angles obtuse, strongly rounded; lateral sides crenate; carinae sharp up to centre of disk, obtuse beyond; central small carina not present; lateral small carinae slightly noticeable; central carinae with testaceous scale tufts; lateral small carinae with small, testaceous scale tufts; posterior angles with a prominent testaceous scale tuft; carinae posterior scale tufts missing. Scutellum: long, approximately triangular, apically obtuse, covered with recumbent, testaceous scales.

Elytra: slightly shiny, mostly glabrous, with lateral margins a bit widened outward; in some places covered with black or testaceous semi-erect, small scales forming a definite pattern (Fig. 2h); humeral umbones rounded and prominent, with prominent mixed black and testaceous scale tufts; anteapical umbones noticeable, with smaller mixed testaceous and black scale tufts.

Propygidium: slightly shiny, covered with in dense some places, recumbent or inclined, sometimes coffee-grain shaped, testaceous scales; posterior margin curved inward at the middle, with two mixed testaceous/black scales; cones elevated, blunt; approximately rounded, white, cretaceous areas at centre and laterally.

Pygidium: slightly shiny, covered with dense, erect, coffee-grain shaped in some places, testaceous scales; white, rounded, cretaceous area present laterally, close to centre of lateral margins; two smaller similar areas present at centre of dorsal margin and close the apex (Fig. 1); ventral half narrowing smoothly to apex; apex rounded in lateral view and exhibiting a row of erect, testaceous scales.

Protibiae: light brown with five external teeth: first long and pointed, third long and apically rounded, second smaller and pointed, fourth large, short and blunt, fifth short and pointed.

Meso- and metatibiae light brown, centrally slightly enlarged, with noticeable central, acute tooth, and some scattered, long, erect, testaceous scales; first metatarsomere about twice as long as second.

Abdomen: light brown, covered with testaceous, small, recumbent scales on the visible sternites; anal sternites brown, shiny and glabrous, but with fringe of very small, testaceous, recumbent scales at posterior margin.

DISTRIBUTION. Yunnan.

REMARKS. The female is unknown.

TYPE SERIES VARIABILITY. The six types are very similar to each other. One has darker elytra and pronotum. The white cretaceous areas are more or less extended, but always four and distinguishable. The fringe of testaceous scales at apex of pygidium often looks double pointed, but without forming a true scale tuft.

DIAGNOSIS. *D. ligthbrowni* can be distinguished from the other Chinese species for the four prominent white cretaceous areas present on its pygidium. It differs from the other species with same cretaceous areas, for having the body light brown instead of brown to black by having two prominent testaceous scale tufts on the

posterior margin of propygidium. *D. lighthbrown* can be confused with *D. ovicollis* from Myanmar, a species with same size and colour, but it can be easily separated from this due to the shape of its parameres, which have a bigger lobe on external margin (Fig. 2i). Also in *D. lighthbrowni* the posterior corners of pronotum are obtuse (whereas those of *D. ovicollis* are strongly rounded) and show a testaceous scale tuft on the lateral small carinae (not present in *D. ovicollis*).

DERIVATIO NOMINIS. The name of the species comes from its prevailing light brown colour.

***Dasyvalgus minutus* Ricchiardi n. sp. (Fig. 7f,g).**

TYPE SERIES. HT ♂ IZAS, China, Xizang, Xia Cha Yu, Zayu County, 28 Jul 2006; 77 PT ♂ ERC, 5 PT ♂ IZAS, same data as the HT.

HOLOTYPE DESCRIPTION. Length 4.5 mm, width 2.8 mm. Body black.

Head: slightly shiny, covered with shallow, large, punctures. Clypeus anteriorly sinuate, suctorial brush longer than the clypeus length.

Pronotum: anteriorly narrower, sub-trapezoidal, crenate at sinuate sides; hind angles obtuse; carinae outwardly arched, sharp up to the centre of disk, blunt beyond this, ending around $\frac{3}{4}$ of the pronotum length; central small carina not present; small lateral carinae obsolete; scale tufts on central small carinae small and black; carinae posterior scale tufts as above; posterior angle scale tufts small and black. surface of disc rugose, glabrous

Scutellum: short, triangular, apically obtuse, glabrous. Elytra: slightly shiny, mostly glabrous; humeral and anteapical umbones with a small scale tuft made of few, erect, black scales.

Propygidium: opaque, glabrous, covered with round, thick punctuation; two prominent black scale tufts at posterior margin.

Pygidium: opaque, covered with same punctures as propygidium, narrowing towards apex; scattered, erect, bristle like, black scales close to the lateral margins and apex.

Protibiae: with five external teeth: first three long and pointed, fourth and fifth smaller and pointed. Meso and metatibia centrally enlarged, with noticeable central tooth, and some very scattered, long, erect, bristle like, black scales; first metarsomere about twice as long as second.

Abdomen: glabrous, covered with round, shallow, large punctuation.

DISTRIBUTION. The type series was collected in Xizang), in the Zaiü County, a valley that ends in Arunachal Pradesh.

REMARKS. The female is unknown.

TYPE SERIES VARIABILITY. Within the paratypes there are no noticeable variations.

DIAGNOSIS. *D. minutus* can be easily recognized for its reduced dimension (Fig. 7f), being the smallest of the Chinese *Dasyvalgus*, and because it is completely black. The only other completely black Chinese species, *D. carbonarius*, shining body, while *D. minutus* is opaque, and it is much bigger. The parameres are also distinctive (Fig. 7g).

DERIVATIO NOMINIS. The name of this species derived from its small size.

***Dasyvalgus montivagus* Moser, 1915 (Fig. 2d,e)**

TYPE SERIES (here designated). Lectotype ♂ MNHUB, Vietnam, Tonkin, Montes Mauson, 2-3000 feet, May-Jun, H. Fruhstorfer legit; 8 PLT ♂ MNHUB, same data as LT.

OTHER EXAMINED MATERIAL: 1 ♂ ERC, Guangxi, Mt. Dayaoshan, Linxiang, Jinxiu, 700 m, 25 Apr/5 May 2014, HuangYuanyong & Lidong legit.

DISTRIBUTION. This species, previously know from North Vietnam only (Moser 1915; Paulian 1961) extend its range to Guangxi too.

REMARKS. The females is unknown.

DIAGNOSIS. From the other Chinese species *D. montivagus* can be separated for the four prominent cretaceous areas on pygidium. From the other species with same cretaceous areas for having the pygidium mostly glabrous. The parameres too are distinctive.

TYPE SERIES VARIABILITY. The specimen from Guangxi differs from the type series only for having cpt's obsolete. Being the parameres shape, both in superior and lateral views, identical if the Guangxi specimen at end will prove to belong to a subspecies or not will depend on the exam of more material.

***Dasyvalgus motuoensis* Ricchiardi n. sp. (Fig. 7a,b).**

TYPE SERIES. HT ♂ IZAS, China, Xizang, Motuo District, Hanmi, Aug 2013. 1 PT ♂ ERC, same data as the holotype.

HOLOTYPE DESCRIPTION. Length 5.9 mm, width 3.3 mm. Body black.

Head: slightly shiny, covered with small punctures and dense, inclined yellowish scales forming two small scale tufts on frons. Clypeus anteriorly slightly sinu-

ate, covered with same punctures and very scattered, inclined yellowish scales; suctorial brush longer than the clypeus length.

Pronotum: anteriorly narrower, semi-trapezoidal, noticeably crenate at sinuate sides; anterior angles acute and sharp, posterior one obtuse; medially convexly arcuate; carinae obsolete; central small carina not present, lateral small carinae obsolete; covered with very dense, recumbent, long, C-shaped yellowish scales.

Scutellum: triangular, longish, apically obtuse, covered with very dense, recumbent, yellowish scales.

Elytra: covered with very dense, recumbent yellowish scales except for areas around umbones, centre of lateral declivity and centre of disc where the scales are black; scale tufts on humeral umbones yellowish and prominent.

Propygidium: covered with very dense, recumbent, coffee-grain like, yellowish scales forming two prominent scale tufts at posterior margin.

Pygidium: narrowing towards apex, covered with very dense, recumbent (in some places semi-erect) yellowish scales forming fringe at apex.

Protibiae: with five external teeth: first and third long and pointed, second, fourth and fifth short and pointed. Meso and metatibia centrally enlarged, with noticeable central tooth, and long, inclined, bristle like, yellowish scales. First metatarsomere about twice as long as second. Abdomen: covered with recumbent, very dense, yellowish scales; anal sternites mostly glabrous.

DISTRIBUTION. The type series was collected in south Xizang, in the Motuo County.

REMARKS. The female is unknown.

TYPE SERIES VARIABILITY. The PT is a bit shorter than the HT (5.4 mm, width 3.1 mm), the scale tufts on its pronotum are darker, most of the scales on lateral declivity and posterior margin of elytron are blackish.

DIAGNOSIS. *D. motuoensis* can be distinguished from the other Chinese *Dasyvalgus* for the propygidium and pygidium, which are covered with dense and yellowish coffee-grain shaped decumbent scales; for the prominent, testaceous, scale tufts of the posterior margin of propygidium, etc. The parameres too are distinctive (Fig. 7b). Within the Chinese *Dasyvalgus*, *D. motuoensis* can only be potentially confused with *D. penicillatus* from it which can be distinguished for the carinae (present, rounded, arched outwardly, ending at centre of disk in *D. motuoensis*; obsolete in *D. penicillatus*). The parameres of *D. penicillatus* (Fig. 7c) are similar but distinct from those of *D. motuoensis* (Fig. 7b).

Dasyvalgus paratomentatus Ricchiardi n. sp. (Fig. 2f,g).

TYPE SERIES. HT ♂ IZAS, China, Yunnan, 100 Km W of Kummig, Diaolin Nat. Res., 22 May/2 Jun-1993, E. Jendek legit. 21 PT ♂ ERC, 1 PT ♂ SNMS, 2 PT ♂ IZAS, same data as the HT.

HOLOTYPE DESCRIPTION. Length 6.3 mm, width 3.7 mm. Body brown.

Head: black, slightly shiny, covered with shallow, large punctures and with scattered, inclined, testaceous scales forming three scale tufts on frons. Clypeus pale brown, almost glabrous, anteriorly sinuate, covered with same punctuation; suctorial brush longer than the clypeus length.

Pronotum: black or brown in some places, ovate, medially convexly arcuate; anterior angle acute, posterior angle obtuse; lateral sides crenate; carinae sharp up to centre of disk, rounded beyond this; central small carina not present; lateral small carina obsolete; covered with dense, testaceous, recumbent scales in some places; lateral small carinae covered with testaceous scale tufts; mixed testaceous/black scaled tufts at centre of carinae; scale tuft on posterior angle prominent and testaceous; carina posterior tuft small, made with mixed testaceous/black scales.

Scutellum: long, brown, approximately triangular, apically obtuse, covered with recumbent, testaceous scales. Elytra: slightly shiny, mostly glabrous, brown or black in some places, with lateral margins slightly widened; covered with black or testaceous, recumbent small scales forming a definite pattern (Fig. 2f) in some places; humeral umbones rounded and prominent, with showy black and testaceous scale tufts; anteapical umbones noticeable, with smaller black scale tufts.

Propygidium: brown, slightly shiny, covered with dense, recumbent, coffee-grain shaped, testaceous scales in some places; posterior margin curved inward at the middle, with two tufts made of erect, black scales; cones sharp; rounded, white, cretaceous area at centre and laterally.

Pygidium: brown, slightly shiny, covered with shallow, rounded, dense punctuation; covered with dense, recumbent, coffee-grain shaped, testaceous scales in some places; two small whitish cretaceous areas present at centre of dorsal margin and close to apex (Fig. 1); ventral half smoothly narrowing toward apex; apex rounded in lateral view and without scale tuft.

Protibiae: dark brown to black, with five external

teeth: first and third long and pointed, second smaller and pointed, fourth large, short and blunt, fifth short and blunt.

Meso- and metatibiae: dark brown, centrally slightly

enlarged, with noticeable central tooth, and some scattered, long, erect, testaceous scales; first metarsomere about twice as long as second.

Abdomen: dark brown, covered with testaceous,

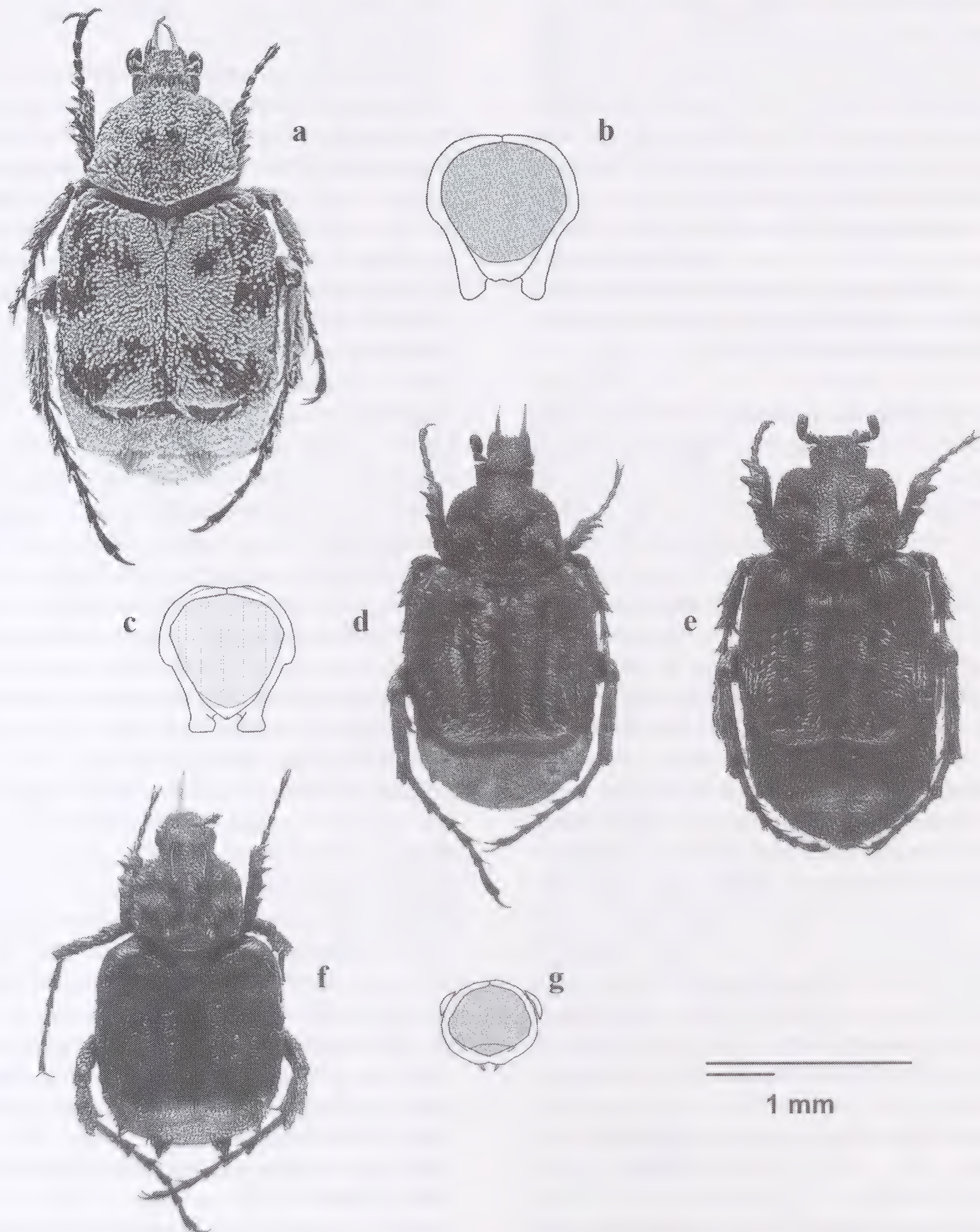


Fig. 7. Habitus and parameres of: a,b – *D. motuoensis* (HT male IZAS); c-e – *D. penicillatus* (d, male, e female, from Ricchiardi, 2012); f,g – *D. minutus* (HT male IZAS).

small, recumbent scales on visible sternites; anal sternites brown, shiny and glabrous.

DISTRIBUTION. The type series was collected in Yunnan.

REMARKS. The female is unknown. One paratype was collected on flowers of *Castanea* sp.

TYPE SERIES VARIABILITY. All the PT's are very similar to the HT, but their length varies from 5.9 to 6.3 mm. In some PT the lateral lobe at the centre of the outer margin of the parameres is slightly wider than average.

DIAGNOSIS. *D. paratomentatus* can be separated from the other Chinese species for the four prominent white cretaceous areas on pygidium. Although similar to *D. tomentatus*, *D. paratomentatus* can be distinguished with difficulty for its lighter clypeal colour and for scale tuft on anteapical umbones made of mixed black and testaceous scales (in *D. tomentatus* black that are purely black). In any case, the only conclusive way of distinguishing the two species is by comparing the shape of their parameres (Fig. 2g,l).

Dasyvalgus penicillatus (Blanchard, 1850) (Fig. 7c-e).

TYPE SERIES. LT ♂ MNHN, Inde Sept. (without further data).

OTHER STUDIED MATERIAL. 1 ♂ ERC, China, Tibet, Motuo County, Hanmi, Aug 2013. New record for China.

REMARKS. This is first record for this species in China. The Motuo County is a Tibetan valley ending in Arunachal Pradesh, which exhibits a *Dasyvalgus* fauna similar in some extent to that of the Pre-Himalayan Sub region one (Ricchiardi, 1998, 2012). Due to lack of recent records, potential relationships with the Myanmar's *Dasyvalgus* cannot be defined.

The *D. penicillatus* specimen from Xizang is brown, while the specimens from Nepal are more often blackish. The only Chinese species similar to *D. penicillatus* is *D. motuoensis*, which is longer (Fig. 7a). The parameres are distinctive (Fig. 7b,c). The female of *D. penicillatus* can be distinguished from its male for wider protibia, more squared pronotum, longer propygidium, lobed apex pygidium and posterior margin of pronotum centrally two pointed toward scutellum.

Dasyvalgus rufipes Ricchiardi n. sp. (Fig. 6d,e).

TYPE SERIES. HT ♂ IZAS, China, Hainan, Sanya County, Mt. Janfeng, 1/12 Jul 2004. 9 PT ♂ ERC, same data as the holotype; 1 PT ♂ ERC, Guanxi, Dayaoshan, Pingzhao, Jinxiu, 15/25 May 2014, Zhaojinsheng legit; 1 PT ♂ ZFMK, Laos, Ban Saleui, Phou

Pan Mt., 20°12'N, 104°01'E, 1300-1900 m, 1/31 May 2011, legit C. Holzschuh.

HOLOTYPE DESCRIPTION. Length 6.5 mm, width 4.0 mm. Body black.

Head: slightly shiny, glabrous, covered with shallow, large, confluent punctures; frons with a rounded prominence at centre. Clypeus anteriorly sinuate, covered with same puncture as above; suctorial brush longer than the clypeus length.

Pronotum: black, trapezoidal, glabrous, medially convexly arcuate; anterior angles acute; posterior angles with apex pointed; lateral sides crenate, hollow internally; covered with very large, shallow punctures, rugose at posterior angles and posterior part of lateral margins; carinae obtuse, semi-parallel, ending at centre of disk; central and lateral small carinae not present; only four small, black scale tufts present along posterior margin.

Scutellum: long, black, brown at centre, approximately triangular, apically obtuse, with very scattered recumbent, testaceous scales.

Elytra: slightly shiny, mostly glabrous, laterally red, centrally blackish, with lateral margins slightly widened outward; second interstriae with small erect, dense scales, black at centre, testaceous elsewhere; fourth interstriae with some small, erect, scattered, testaceous scales; humeral umbones rounded and prominent, with black scale tufts; anteapical umbones slightly noticeable, without scale tufts.

Propygidium: black, rugose, opaque, glabrous; posterior margin curved inward at the middle, with two small black scale tufts; cones sharp.

Pygidium: black, opaque, glabrous, rugose, ventral half restricted to apex, which exhibit a round prominence; apex bent apart in lateral view and exhibiting fringe of small, testaceous scales.

Protibiae: black, with five external teeth: first to third long and pointed, fourth and fifth small and pointed.

Meso and metatibia: black, glabrous, slightly enlarged, with noticeable central tooth. First metatarsomere about twice as long as second, apically externally pointed.

Abdomen: black, glabrous, covered with large, rounded, shallow punctuation; anal sternites brown, shiny and glabrous.

DISTRIBUTION. The species is known from Hainan Island and Laos.

DERIVATIO NOMINIS. The species is named after its typically red elytrae.

REMARKS. The female is unknown.

TYPE SERIES VARIABILITY. PT's are very similar to HT.

DIAGNOSIS. *D. rufipes* can be easily recognized by being mainly glabrous, with body black and elytrae mainly red; the parameres are distinctive (Fig. 6d).

Dasyvalgus rugosus Ricchiardi, 2013 (Fig. 6i,j, Ricchiardi, 2013).

TYPE SERIES. HT ♂ NMER, China, Yunnan (without further data).

REMARKS. The female is unknown. This Chinese species, known from the HT only, can be easily distinguished for the scattered, orange, erect scales on propygidium and pygidium (Fig. 6j). The parameres are also distinctive (Fig. 6i).

Dasyvalgus sommershofi Endrödi, 1952 (Fig. 4h,j).

STUDIED TYPES. 1 PT ♂ NHM 1 PT ♂ ERC, Fujian, Kuatun, 20 May 1946, Tchunh Sen legit; 1 PT ♂ ERC, same data but 6 Jun 1946; 1 PT ♂ ERC, same data but 6 Sep 1946.

Other studied material. 6 ♂ ZFMK, 1 ERC, Fujian, Kuatun, 27°40'N, 117°40'E, 2300 m, 10 Aug 1938, J. Klapperich legit; 1 ♂ 1 ♀ ERC, Fujian, Kuatun, 22 Jul 1946, Tchunh Sen legit (These two specimens should belongs to the Endrödi type series, but they were not labelled as such); 1 ♂ ERC, Fujian, Wuyi Gong, 1/3 Jul 1991, M. Nicodým legit.

FEMALE FIRST DESCRIPTION. Length 5.8 mm; width 3.4 mm. Body brown.

Head: black, slightly shiny, covered with scattered, erect, testaceous scales not forming scales tufts. Clypeus brown, sinuate at anterior margin; with scattered, erect, bristle like, testaceous scales; suctorial brush much shorter than in the male.

Pronotum: brown, enlarged ovate, shiny, covered with large, shallow, rounded punctuations, many of which have a white, cretaceous marking inside; strongly crenate at sides; anterior and posterior angles obtuse; posterior margin curved towards scutellum, centrally slightly bent downwards; carinae outwardly slightly arched, rounded up to centre of disk, obsolete beyond this, ending at 3/4 of pronotum length; central small carina not present; lateral carinae long, sharp; only four scale tufts are present on the postero-lateral umbones, consisting of a few long, testaceous, erect scales; remainder of surface mostly glabrous, but with very scattered, bristle like, testaceous scales; close to the posterior angles, into the lateral depressions, the posterior part of a central line long as all pronotum

and close to the anterior angles, there is a white, testaceous clothing.

Scutellum: brown, glabrous, rugose, long, triangular, apically obtuse.

Elytra: brown, shiny, mostly glabrous; with a shallow juxtascutellar depression; humeral and anteapical umbones slightly elevated, with hardly noticeable tufts made of erect, bristle like, testaceous scales; rows of white, cretaceous spots present in all the striae and at centre of interstriae.

Propygidium: brown, slightly shiny, glabrous, covered with big, shallow, round and dense punctuation often bearing inside white, cretaceous markings; posterior margin curved inward at the middle, with two small tufts made of erect, bristle like, testaceous scales; cones elevated and blunt.

Pygidium: brown, slightly shiny, almost glabrous, covered with large punctuation and bristle like scales as in propygidium; ventral half narrowing sharply toward apex, which exhibits a pointed projection; apex of pygidium is very arched in lateral view.

Protibiae: brown, enlarged, with five external teeth: first long and pointed, second very sort, enlarged and blunt, third long and blunt, fourth enlarged and very blunt, fifth, short, enlarged and blunt.

Meso and metatibiae dark brown, centrally enlarged, with a noticeable sharp tooth, and some scattered, long, erect, testaceous scales; metatibial apex enlarged, pointed centrally and at sides; first metarsomere slightly less than twice the length of second; first metatarsomere apically slightly enlarged and spiny.

Abdomen: brown, almost glabrous, covered with scattered, large, shallow, rounded punctuation containing white cretaceous spots in the last two visible sternites.

Anal sternites brown, glabrous, with a row of small, erect, bristle like, testaceous scales at posterior margin.

DISTRIBUTION. The species is known from Fujian.

REMARKS. The specimens could be confused with *D. laligantii*, but they are much less scaly. Moreover, the propygidium scale tufts on their propygidium are testaceous whereas in *D. laligantii* they are blackish. The parameres of *D. sommershofi* (Fig. 4j) are distinctive. The female can be distinguished from the male for the wider protibia, the longer propygidium, the shape of the pygidium, etc.

Dasyvalgus tomentatus Ricchiardi sp.n. (Fig. 2k,l).

TYPE SERIES. HT ♂ IZAS, Yunnan, Lijang, 8/24-Jun-1994, B. Siska & T. Spevar legit; 3 PT ♂ ERC, Yun-

nan, Lijiang, Same data as the HT; 8 PT ♂ ZMUC, 1 PT ♂ ERC, Yunnan, 9-Sep-1919, Simeon Tèn legit; 6 PT ♂ ERC, Yunnan, Lijiang, 31-May-1997; 1 PT ♂ IZAS, Yunnan, Wuding County, Bailu (25°32'16"N, 102°24'38"E), 2600 m, 4 Jun 1980, Li Shengyuan legit; 1 PT ♂ IZAS, Yunnan, Weixi Pantiage (27°20'13"N, 99°13'41"E), 3500 m, 24 Jul 1987, Zhang Xuezhong legit; 1 PT ♂ IZAS, Sichuan, Yajiang, Bajiaolouxian (30°04'44"N, 101°08'36"E), 29 May 2009, Wang Zhiliang legit; 1 PT ♂ IZAS, Sichuan, Mianning (28°33'23"N, 102°11'03"E), 5-VIII-1958.

HOLOTYPE DESCRIPTION. Length 6.5 mm, width 3.6 mm. Body black.

Head: black, slightly shiny, covered with shallow, large punctures and with scattered, decumbent, testaceous scales forming three scale tufts on frons. Clypeus brown, almost glabrous, anteriorly sinuate, covered with same punctuation; suctorial brush longer than the clypeus length.

Pronotum: black, ovate, medially convexly arcuate; anterior and posterior angles obtuse; lateral sides crenate; carinae sharp up to centre of disk, rounded beyond this; central small carina not present; lateral small carinae obsolete; covered with dense, testaceous, recumbent scales; central carina scale tuft black; lateral small carina with small testaceous scale tuft; posterior angle scale tuft testaceous; carina posterior tuft prominent and testaceous.

Scutellum: long, brown, approximately triangular, apically obtuse, covered with recumbent, testaceous scales.

Elytra: shiny, brown or black in some places, with lateral margins slightly widened outward; covered with black or testaceous inclined small scales forming a definite pattern in some places (Fig. 2k); humeral umbones rounded and prominent, with showy black scale tufts; anteapical umbones noticeable, with smaller black scale tufts.

Propygidium: black or brown in some places, shiny, covered with dense, recumbent, coffee-grain shaped, testaceous scales in some places; posterior margin curved inward at the middle, with two tufts consisting of erect, black and testaceous scales; cones sharp; rounded, white, cretaceous areas present at centre and laterally.

Pygidium: black or brown in some places, shiny, covered with shallow, rounded, dense punctuation; covered with dense, recumbent, coffee-grain shaped, testaceous scales in some places; rounded, white, cre-

taceous area laterally, close to centre of lateral margins; two smaller similar areas at centre of dorsal margin and close to apex (Fig. 1); ventral half narrowing smoothly toward apex; apex rounded in lateral view and without scale tuft.

Protibiae: dark brown, with five external teeth: first and third long and pointed, second smaller and pointed, fourth large, short and blunt, fifth short and blunt.

Meso- and metatibiae: dark brown, centrally slightly enlarged, with noticeable central tooth, and some scattered, long, erect, testaceous scales; first metatarsomere about twice as long as second.

Abdomen: black, covered with testaceous, small, recumbent scales on visible sternites; anal sternites brown, shiny and glabrous.

REMARKS. The female is unknown.

TYPE SERIES VARIABILITY. The PT's are quite close to the HT. Their length vary from 5.5 to 6.5 mm.

DISTRIBUTION. The species is known from Yunnan and Sichuan.

DIAGNOSIS. *D. tomentatus* can be separated from the other Chinese species for the four prominent white cretaceous areas on the pygidium. Compared to the other species *D. tomentatus* is particularly close to *D. Paratomentatus* and can be distinguished with difficulty mainly by exhibiting a darker clypeal colour and, for the scale tufts on the anteapical umbones of its elytra consisting of black scales (versus mixed testaceous/black in *D. paratomentatus*). However, the only conclusive way to distinguish the two species is through the shape of their parameres (Fig. 2l).

***Dasyvalgus varius* Ricchiardi n. sp. (Fig. 2m,n).**

TYPE SERIES. HT ♂ IZAS, Sichuan, Shimian, Liziping Nature Reserve (29°02'4"N, 102°22'45"E), 2012 m, 23 Jun 2012, Yang Ganyan legit; 1 PT ♂ ERC, Sichuan, Mt. Emeishan, 27-May-1990, Hajime Nara legit.

HOLOTYPE DESCRIPTION. Length 6.2 mm, width 3.4 mm.

Head: black, slightly shiny, covered with shallow, large punctures and with scattered, inclined, testaceous scales forming two scale tufts on the frons. Clypeus brown, anteriorly sinuate, covered with same punctuation, almost glabrous; suctorial brush longer than the clypeus length.

Pronotum: black, ovate, medially convexly arcuate; anterior and posterior angles obtuse; lateral sides crenate; carinae sharp up to the centre of disk where they ends; central small carina not present; lateral small carinae short, posteriorly facing outwards; almost

glabrous, with scattered, testaceous, recumbent scales in some places; scale tufts on central carina black; small lateral carinae without scale tufts; scale tufts on posterior angles black and testaceous; carina posterior scale tufts not present.

Scutellum: long, dark brown with sides black, triangular, apically obtuse, covered with recumbent, testaceous scales.

Elytra: brown, shiny, with lateral margins slightly widened; covered with black, yellow or testaceous, inclined small scales forming a definite pattern in some places (Fig. 2m); humeral umbones rounded and prominent, with black and testaceous scale tufts; anteapical umbones slightly noticeable, with smaller black and testaceous scale tufts.

Propygidium: black or brown in some places, shiny, covered with very scattered, erect, bristle like, testaceous scales; posterior margin curved inward at the middle, with two tufts made of erect, black scales; cones sharp; rounded, white cretaceous areas present at centre and laterally.

Pygidium: glabrous, shiny, covered with shallow, rounded, dense punctuation and with erect, bristle like, testaceous scales; a rounded, white, cretaceous area present laterally, close to centre of lateral margins; two smaller similar areas present at centre of dorsal margin and close (Fig. 1); ventral half narrowing towards apex; apex obtuse in lateral view and exhibit a small, testaceous, double pointed scale tuft.

Protibiae: dark brown, with five external teeth: first and third long and pointed, second smaller and pointed, fourth small, short and blunt, fifth short and pointed.

Meso- and metatibiae dark brown, centrally slightly enlarged, with a central tooth, and some scattered, long, erect, testaceous scales; first metatarsomere about twice as long as second.

Abdomen: brown, covered at centre with testaceous, erect scales on the visible sternites; anal sternites shiny and almost glabrous.

DISTRIBUTION. This species is known from a two specimens coming from Sichuan.

TYPE SERIES VARIABILITY. The PT ♂ ERC has body brown instead of black; its umbones scales tufts are only made with black scales, instead of mixed testaceous/black as the HT.

REMARKS. The female is unknown.

DIAGNOSIS. *D. varius* can be separated from the other Chinese species for the four prominent white cretaceous

areas on the pygidium. Within the species that show four whitish cretaceous areas on pygidium, this species can be distinguished for its mostly glabrous propygidium and pygidium and for the propygidium posterior margin scale tufts formed of black scales. The shape of its parameres is also very distinctive (Fig. 2n).

SPECIES EXCLUDED FROM CHINA FAUNA

Dasyvalgus sellatus (Kraatz, 1883).

TYPE SERIES (here designated). LT ♂ SDEI (Coll. Kraatz), Malacca; 5 PT ♂ SDEI, 1 PT ♂ ZMHA, Malacca.

REMARKS. In his Catalogue of the Chinese Cetoniidae, Krajcik (2011), quoting Kraatz (1883, pages 375 - 376), wrote that *D. sellatus* is present in Hong Kong. However the only specimen determined by Kraatz as *D. sellatus* (which do not appears to be part of the type series) labelled "Hong Kong" is actually a *D. laligantii*.

D. sellatus is known so far from the Malaysian Peninsula only, but could inhabits other Sundaland areas. Its parameres are very different from those of *D. laligantii* (Fig. 4k). The female is unknown.

KEY OF MALES (including *D. ovicollis* Arrow, 1910 from Myanmar; see Taxonomy section of this work).

1. Pygidium with four prominent white cretaceous areas (Fig. 1)2
2. Pygidium without such cretaceous areas or with barely noticeable cretaceous markings 8
- Propygidium with two prominent testaceous scales tufts at posterior margin; body mainly light brown, sometimes brown in some places.....3
- Propygidium with two small black or mixed black/testaceous scales tufts at posterior margin; body brown to black.....4
3. Posterior angles of pronotum obtuse; pronotum lateral small carinae scale tufts present and testaceous*ligthbrowni* n.sp.
- Posterior angles of pronotum obtuse and strongly rounded; pronotum lateral small carinae scales tufts not present*ovicollis* (Myanmar)
4. Pygidium mostly glabrous5
- Pygidium more or less covered with scales6
5. Propygidium mostly glabrous*varius*
- Propygidium covered with recumbent, testaceous scales.....*montivagus*
6. Pronotal carinae present but obtuse and ending at centre of disk; posterior angles of pronotum strongly rounded; apical fifth of pygidium elevated

- (lateral view) *benesi*
Pronotal carinae present and sharp; posterior angles of pronotum obtuse, but not strongly rounded; apex of pronotum rounded in lateral view 7
7. Propygidium with two small black scale tufts at posterior margin *paratomentatus*
Propygidium with two small black/testaceous scale tufts at posterior margin *tomentatus*
8. Propygidium, pygidium, pronotum and elytra mostly glabrous (but with some scale tufts) 9
Propygidium, pygidium, pronotum and elytra mostly scaly 12
9. Head, pronotum, elytron, propygidium and pygidium black 10
Head black, elytron or pygidium/propygidium red 11
10. Body small (shorter than 4.5 mm); pronotal carinae present but obtuse, arched outwardly, ending at centre of disk; apex of pygidium regularly rounded *minutus*
Body larger; pronotal carinae present but obtuse, arched outwardly, ending well after centre of disk; pygidium narrowing toward apex *carbonarius*
11. Elytra red; propygidium and pygidium black
..... *rufipes*
Elytra black; propygidium and pygidium red
..... *inouei*
12. Pronotum black, very rugose, with prominent, sharp outwardly arched central carina, ending a bit before centre of disk; propygidium and pygidium black, covered with scattered, erect, bristle like orange scales *rugosus*
Pronotum not very rugose; propygidium and pygidium covered with different scales 13
13. Propygidium and pygidium covered with dense, recumbent, coffee-grain like, testaceous scales ...
..... 14
Propygidium and pygidium with different scales or glabrous 15
14. Propygidium and pygidium ground colour black; pronotal carinae present, rounded, arched outwardly, ending at centre of disk *motuoensis*
Propygidium and pygidium ground colour brown; pronotal carinae obsolete *penicillatus*
15. Propygidium and pygidium almost glabrous; pygidium narrowed to the apex, where there is a rounded projection *becvariensis*
Propygidium and pygidium scaly 16
16. Propygidium and pygidium black (but cones reddish), covered with dense, erect, C-shaped, testaceous scales; posterior margin of propygidium with two very prominent testaceous scale tufts; apex of pygidium with double pointed, prominent, testaceous scale tuft *ichangicus*
Propygidium and pygidium brown, covered with different scales 17
17. Posterior corners of pronotum with apex pointed; carinae posterior scale tufts testaceous; propygidium posterior margin scale tufts testaceous; propygidium and pygidium without white cretaceous markings *sommershofi*
Posterior pronotal corners obtuse; carinae posterior scale tufts black; propygidium posterior margin scale tufts black; propygidium (around cones) and pygidium (close to the superior corners) with some barely noticeable white cretaceous markings
..... *lalignantii*

ACKNOWLEDGMENTS

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REFERENCES

- ARROW G., 1910 - The fauna of British India including Ceylon and Burma. Coleoptera: Lamellicornia: Cetoniinae and Dynastinae. London.
- JAMESON M.L., SWOBODA K.A., 2005 - Synopsis of Scarab Beetle Tribe Valgini (Coleoptera:Scarabaeidae: Cetoniinae) in the New World. Annals of the Entomological Society of America, Columbus, Washington, 98 (5): 658-672.
- KRAATZ G., 1883 - Ueber die Gattung *Valgus* und eine Anzahl neuer Arten derselben. Deutsche Entomologisches Zeitschrift, Berlin. XXVII, Heft II: 373-379.
- KRAJCIK M., 2011 - Illustrated Catalogue of Cetoniinae, Trichiinae and Valginae of China (Coleoptera : Cetoniidae). Animma. X, Supplement 1/2011, Plzen.
- MOSER J., 1915 - Neue Melolonthiden un Cetoniden (Col.). Deutsche Entomologische Zeitschrift, Berlin: 579-605.
- LING C., YANLING S., SHUFANG X., 2008 - The boundary of palaearctic and oriental realms in western China. Science Direct, Progress in Natural Science, 18: 833-841.
- PALESTRINI C., SIMONIS A., ZUNINO M., 1985 - Modelli di distribuzione dell'entomofauna della Zona di Transizione Cinese, analisi di esempi e ipotesi sulle sue origini. Biogeographia, Bologna, 9: 195-209.
- PAULIAN R., 1961 - Coléoptères Scarabéides de l'Indochine (Rutelines et Cétonines). Annales de la Société Entomologique de France, Paris, 130: 1-47 (225-271).
- RICCHIARDI E., 1994 - Revision of the Valginae from Himalaya (Coleoptera, Scarabaeoidea, Cetoniidae). Fragmenta Entomologica, Roma, 26(1): 165-177, 16 figg.
- RICCHIARDI E., 1998 - Notes on the genus *Dasyvalgus* Kolbe, with description of two new species (Coleoptera, Cetoniidae, Valginae). Mitteilungen der Museum Naturkunde Berlin. Zoologische Reihe 74(2): 243-247, 4 figs.
- RICCHIARDI E., 2012 - Notes on the Himalayan Valgina with description of a new genus. Biodiversität und Natursausstattung im Himalaya IV. Herausgegeben von Matthias Hartmann & Jörg Weipert. Verein der Freunde & Förderer des Naturkundemuseums Erfurt, 5: 323-328.
- RICCHIARDI E., 2013 - Description of eight new *Dasyvalgus* and notes on other Valgina (Coleoptera: Cetoniinae). Bollettino della Società Entomologica Italiana, Genova, 145(3): 129-139.

Graziano BASSI* - Jacques NEL**

Due microlepidotteri nuovi per la fauna d'Italia (Lepidoptera: Glyphipterigidae, Acrolepiinae; Tineidae, Hieroxestinae)

Riassunto: Vengono segnalate due specie di microlepidotteri che si aggiungono alla fauna d'Italia: *Digitivalva piozae* Varenne & Nel, 2014 catturata in Sardegna e *Wegneria panchalcella* (Staudinger, 1871) rinvenuta in Basilicata.

Abstract: Two Microlepidoptera new for the Italian fauna (Lepidoptera: Glyphipterigidae, Acrolepiinae; Tineidae, Hieroxestinae). Two microlepidoptera species are newly recorded for the Italian fauna: *Digitivalva piozae* Varenne & Nel, 2014 was trapped in Sardinia and *Wegneria panchalcella* (Staudinger, 1871) was found in Basilicata.

Key words: Lepidoptera, Acrolepiinae, Sardegna, Tineidae, Basilicata, Italia, nuove segnalazioni.

INTRODUZIONE

Lo studio da parte del secondo Autore di parte dei microlepidotteri raccolti negli ultimi 40 anni dal primo Autore, consente la pubblicazione di un resoconto iniziale concernente la fauna italiana. Per l'inquadramento sistematico delle Acrolepiinae, considerate spesso famiglia a sé stante, è stato seguito quanto proposto da Karsholt & Nieukerken (2013).

Glyphipterigidae: Acrolepiinae

Digitivalva piozae Varenne & Nel, 2014

MATERIALE ESAMINATO: Sardegna: 1 ♂, Monte Limbara (Olbia-Tempio), Tempio Pausania, Monte Limbara, 1050 m, 24.VI.2008, legit G. Bassi, genitalia slide 29066 Nel, Coll. Bassi, det. J. Nel.

OSSERVAZIONI: Specie recentemente descritta su due esemplari della Corsica (Varenne & Nel, 2014). L'esemplare catturato al lume a poca distanza da punta Balistreri del Monte Limbara, nel nord della Sardegna, la fa ritenere un tipico endemita sardo-corso, diffuso nella fascia sopra mediterranea. Si distingue dalle altre due specie di *Digitivalva* Gaedike, 1970 presenti in Sardegna, *D. eglanteriella* (Mann, 1855) e *D. occidentella* (Klimesch, 1956) per la morfologia degli apparati genitali (Fig. 1c), sia maschili che femminili e per l'*habitus* più scuro delle congeneri (Fig. 1a). Inoltre la presenza in Sardegna di 2 entità del genere *Acrolepiopsis* porta a 5 le specie di Acrolepiinae, sulle 12 totali presenti sul territorio nazionale, diffuse sull'isola, il che la pone come una

delle regioni più ricche di specie di questa Sottofamiglia in Italia.

Tineidae: Hieroxestinae

Wegneria panchalcella (Staudinger, 1871)

MATERIALE ESAMINATO: 1 ♂, Basilicata, dintorni Tursi (Matera), 3.X.1986, legit Bassi & Scaramozzino, genitalia slide 29251 Nel, Coll. Bassi, det. J. Nel.

OSSERVAZIONI: Si tratta dell'unica entità europea di un piccolo genere diffuso, con 16 specie totali (Robinson, 2001), nelle aree tropicali del Vecchio Mondo (8 in Asia, 6 in Africa) e Oceania (1). Descritta di Sarepta, oggi Krasnoarmeisk, nel Sud della Russia, è stata via via segnalata in diversi Paesi mediterranei fino alle Isole Canarie ed è in espansione verso nord sino all'Ungheria (Tokár & Buschmann, 2012). La cattura in Basilicata, risalente alla metà degli anni '80, dimostra che la specie, ancorché non ancora segnalata, è radicata da tempo nei luoghi adatti del Sud Italia. Da verificare la sua possibile espansione verso il nord del Paese. La colorazione rilucente dell'adulto (Fig. 1b) e l'apparato genitale (Fig. 1d) la rendono facilmente distinguibile dagli altri tineidi europei. DISTRIBUZIONE NOTA: Europa (Bulgaria, Isole Canarie, Grecia, Macedonia, Ucraina, Ungheria, SE Russia), Asia Centrale, Medio Oriente, Nord Africa, Transcaucasia, Turchia.

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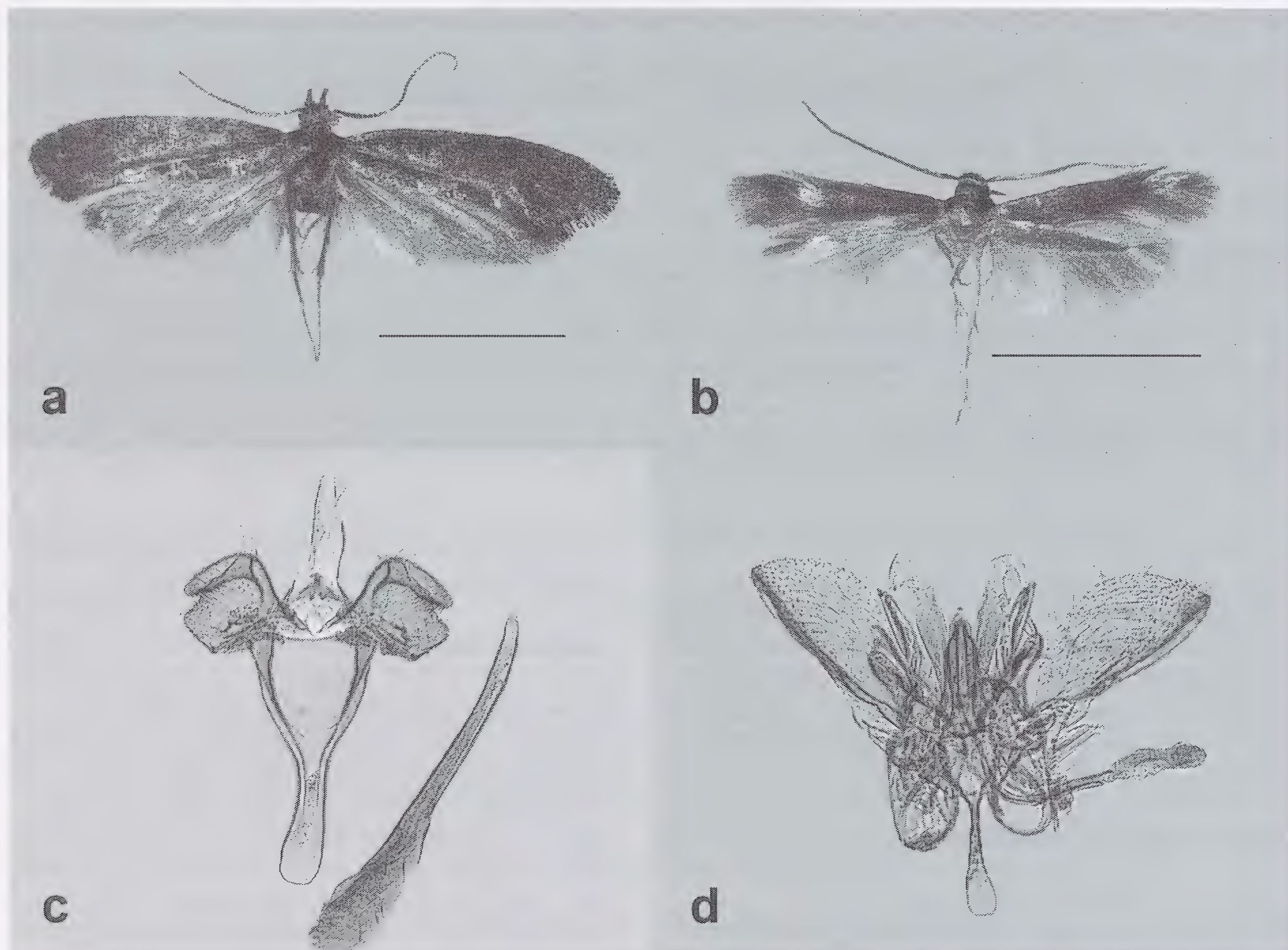


Fig. 1. a – *Digitivalva piozae* Varenne & Nel, habitus, Sardegna, scala 0,4 mm; b – *Wegneria panchalcella* (Staudinger), habitus, Basilicata, scala 0,4 mm; c – *Digitivalva piozae* Varenne & Nel, apparato genitale maschile; d – *Wegneria panchalcella* (Staudinger), apparato genitale maschile.

BIBLIOGRAFIA

- KARSHOLT O., NIEUKERKEN E.J. VAN, 2013 - Lepidoptera, Moths. Fauna Europaea version 2.6.2, <http://www.faunaeur.org>.
 ROBINSON G.S., 2001 - Global taxonomic database of Tineidae (Lepidoptera). Natural History Museum, London. <http://www.nhm.ac.uk/research-curation/research/projects/tineidae/>
 TOKÁR Z., BUSCHMANN F., 2012 - *Wegneria panchalcella* (Staudinger, 1871), new records of Tineidae for Hungary and Central Europe (Lepidoptera: Tineidae). *Microlepidoptera.hu*: 5: 39-44.
 VARENNE T. NEL J., 2014 - Quatre nouveaux microlépidoptères pour la France dont *Coleophora cyrneogenistae* sp. n., *Digitivalva piozae* sp. n., et *Cydia mogeae* sp. n. (Lepidoptera, Tineidae, Coleophoridae, Acrolepiidae, Tortricidae). *Revue de l'Association Roussillonnaise d'Entomologie*, XXIII (1): 27-34.

SEGNALAZIONI FAUNISTICHE ITALIANE

ERRATA CORRIGE: SEGNALAZIONE FAUNISTICA ITALIANA CORRETTA E RIPUBBLICATA

Gli Editors comunicano che a causa di un inconveniente di natura tecnica la pubblicazione della Segnalazione Faunistica Italiana n. 589, apparsa sul Bollettino della Società Entomologica Italiana Vol. 147, No 1, intitolata “*Ctenoplusia accentifera* (Lefèbvre, 1827) (Noctuidae Plusiinae)”, dell’autore Enrico Gallo, è da considerarsi **ritirata**.

La versione corretta e completa della stessa appare in: **BOLL. SOC. ENTOMOL. ITAL., 147 (2): 89-90 (SFI n. 593)**.

Ci scusiamo per l’inconveniente.

* * *

594 - *Harmonia axyridis* (Pallas, 1773) (Coleoptera Coccinellidae)

IABLOKOFF-KHNZORIAN S.M., 1982 - Les Coccinelles Coléoptères-Coccinellidae Tribu Coccinellini des régions Paléarctique et Orientale. Boubée. Paris, France. 568 pp.

Prima segnalazione per la Puglia meridionale di specie paleartica orientale di recente introduzione in Europa e in Italia, nota finora per il Piemonte, la Lombardia, l’Emilia-Romagna, il Veneto, il Friuli-Venezia Giulia, la Liguria, il Trentino-Alto Adige, la Toscana, il Lazio, le Marche, l’Abruzzo, la Puglia settentrionale e la Sardegna.

REPERTI. Puglia: prov. Lecce, Otranto, m 2 s.l.m., su vegetazione litoranea, 21.VIII.2013, N. Olivieri leg., 2 es., (det. et coll. Olivieri).

OSSERVAZIONI. Specie paleartica orientale, in origine distribuita in Cina, Giappone, isola di Sakhalin, isole Curili, Corea, Mongolia, Siberia meridionale e Kazakistan settentrionale (Dobzhansky, 1933; Iablokoff-Khnzorian, 1982; Kuznetsov, 1997), successivamente divenuta subcosmopolita a causa di molteplici introduzioni antropiche. La diffusione di *H. axyridis* al di fuori dell’areale originario è stata determinata dal suo utilizzo nella lotta biologica ad afidi, coccidi e psillidi, iniziata nel 1916 in California e nelle Hawaii (Iablokoff-Khnzorian, 1982), con l’immissione di esemplari provenienti dal Giappone. Nel 1927 la specie fu introdotta sulla costa del Mar Nero, in Georgia, nel 1951 in Uzbekistan (Iablokoff-Khnzorian, 1982). Nelle regioni del Caucaso i rilasci sono proseguiti tra il 1930 e il 2010 (Belyakova & Polikarpova, 2012), ma solo a partire dal 2006 sono state osservate popolazioni selvatiche di *H. axyridis* (Ukrainsky & Shapovalov, 2010; Orlova-Bienkowskaja, 2014). In California le immissioni si sono ripetute tra il 1964 e il 1965, mentre nel resto del Nord America tra il 1978 e il 1982 (Gordon, 1985) la specie è stata oggetto di introduzioni anche in Georgia, Louisiana, Mississippi, Maryland, Connecticut, Delaware, Ohio, Maine, Pennsylvania e Washington, nonché in Nuova Scozia e Columbia Britannica. A partire dal 1988 *H. axyridis* ha dato origine a popolazioni ferali dapprima in Louisiana (Chapin & Brou, 1991) e poi in Georgia nel 1990 (Teddars & Schaefer, 1994), estesesi successivamente alla quasi totalità del territorio degli Stati Uniti, escludendo l’Alaska. Dal 1994 la specie è segnalata nel settore meridionale del Canada (Coderre *et al.*, 1995), dove attualmente è presente in buona parte del paese, mentre in Messico si è diffusa in buona parte degli stati meridionali, fino al Guatemala (Brown *et al.*, 2011), a partire da introduzioni antropiche (Koch *et al.*, 2006). La specie è presente anche in molti paesi dell’America meridionale, come l’Argentina settentrionale, dove è segnalata in natura dal 2001, dopo l’introduzione avvenuta nel 1986 (Saini, 2004), Brasile (de Almeida & da Silva, 2002; Martins *et al.*, 2009), Cile (Grez *et al.*, 2010), Perù (Grez *et al.*, 2010), Uruguay (Nedvěd & Krejčík, 2010), Paraguay (Silvie *et al.*, 2007), Ecuador (Gonzalez & Kondo, 2012) e Colombia (Amat-Garcia *et al.*, 2011), mentre nel continente africano *H. axyridis* si è diffusa in Egitto (Brown *et al.*, 2008), Repubblica Sudafricana (Stals, 2010), Lesotho (Stals, 2010) e Kenia (Nedvěd *et al.*, 2011). Dallo scorso secolo la specie si è insediata nelle isole Hawaii, mentre non è entrata a far parte della fauna australiana, nonostante la comparsa di alcuni individui. In Europa *H. axyridis* è stata oggetto di rilasci a partire dal 1964 nel settore orientale del continente, in Ucraina (Katsoyannos *et al.*, 1997) e in Bielorussia (Sidlyarevich & Voronin, 1973), mentre dal 1990 sono state eseguite introduzioni nel settore occidentale, inizialmente in Francia, Belgio e Olanda e in seguito in Germania, in Svizzera, nella Repubblica Ceca, in Spagna, in Portogallo, in Grecia e in Italia. In tutti questi paesi, con l’eccezione del Portogallo, la specie si è diffusa in natura, raggiungendo stati nei quali non si sono verificate introduzioni deliberate come Austria, Gran Bretagna, Irlanda, Liechtenstein,

Lussemburgo, Polonia, Lituania, Lettonia, Romania, Bulgaria, Ungheria, Slovacchia, Slovenia, Croazia, Bosnia-Erzegovina, Serbia, Danimarca, Svezia e Norvegia (Brown., 2008; Brown *et al.*, 2011). In Italia *H. axyridis* è stata rilasciata tra il 1995 e il 1999 in colture protette delle regioni settentrionali per il controllo biologico degli afidi (Orlandini & Martellucci, 1997). Nel 2006 popolazioni ferali della specie sono state individuate a Torino (Brown *et al.*, 2008), nel 2007 la specie è stata segnalata in Lombardia (Burgio *et al.*, 2008; Pavesi, 2008; Rastelli, 2008; Cornacchia & Nardi, 2012) e Liguria (Cornacchia & Nardi, 2012), nel 2008 in Veneto (Burgio *et al.*, 2008; Uliana, 2008; Cornacchia & Nardi, 2012) Emilia-Romagna (Burgio *et al.*, 2008, Uliana, 2008) e Friuli Venezia-Giulia (Burgio *et al.*, 2008), nel 2009 in Trentino-Alto Adige (Gobbi & Lencioni, 2009; Cornacchia & Nardi 2012). Nel 2009 *H. axyridis* è stata raccolta in Toscana (Crocì & Bracalini, 2011) e in Sardegna (Dessi, 2009), nel 2010 la specie è stata rinvenuta in Abruzzo (Olivieri, 2011), lungo la costa adriatica, dove appare ora stabilita, sebbene non comune, con presenze anche all'interno della regione (Olivieri, osservazioni personali). Sempre nel 2010 è stata osservata nelle Marche (Paglialunga, 2010) e nel Lazio (Gigli, 2010), mentre nel 2013 è indicata per la Puglia settentrionale, a Manfredonia (Forum Natura Mediterraneo, 2013). Introdotta ai fini di lotta biologica agli afidi, questa specie aliena si è rivelata un pericoloso competitore nei confronti di altri Coccinellidi afidofagi autoctoni e appare potenzialmente dannosa anche nei confronti di altre componenti dell'entomofauna (Bazzocchi *et al.*, 2004; Roy & Wajnberg, 2008; Pell *et al.*, 2008) e di alcune colture. Gli individui appartenenti a questa specie, attiva volatrice, presentano un'elevata capacità di dispersione, compiendo spostamenti per motivi trofici o di svernamento, anche nelle ore notturne (Uliana, 2008; Olivieri, 2011). Le migrazioni, dettate da motivi trofici, avvengono soprattutto durante la stagione estiva e seguono una direzione casuale, spesso determinata dalla direzione dei venti dominanti. Si è calcolato che, grazie anche a fenomeni di trasporto passivo, le popolazioni di *Harmonia axyridis* annualmente possono espandersi su distanze che vanno dai 50 ai 500 km (van Lenteren *et al.*, 2008; Stals, 2010; Brown *et al.*, 2011). In America settentrionale la specie ha impiegato un intervallo temporale di 5-6 anni per diffondersi lungo tutta la costa orientale (Poutsma *et al.*, 2008), in Italia tra il 2008 e il 2013 ha occupato l'intera costa adriatica, coprendo una distanza che in linea retta misura circa 800 km. In Puglia, nella località di rinvenimento, *H. axyridis* si dimostra rara, gli individui sono stati rinvenuti su piante erbacee alle spalle del litorale sabbioso, entrambi gli esemplari raccolti appartengono alla forma *succinea* dotata di colorazione di fondo delle elitre rosso-arancione.

BIBLIOGRAFIA

- AMAT-GARCÍA G., AMAT-GARCÍA E., ARIZA-MARÍN E., 2011 - Insectos invasores en los tiempos de cambio climático. *Innovación y Ciencia*, 18: 45-53.
- BAZZOCCHI G.G., LANZONI A., ACINELLI G., BURGIO G., 2004 - Overwintering, phenology and fecundity of *Harmonia axyridis* in comparison with native coccinellid species in Italy. *BioControl*, 49 (3): 245-260.
- BELIAKOVA N.A., POLIKARPOVA Y.B., 2012 - *Harmonia axyridis* and *Cryptolaemus montrouzieri* acclimatization at the Black Sea coast of the Caucasus. *Plant Protection News*, 4: 43-48.
- BROWN P.M.J., ADRIAENS T., BATHON H., CUPPEN J., GOLDARAZENA A., HAGG T., KENIS M., KLAUSNITZER B.E.M., KOVAR I., LOOMANS A.J., MAJERUS M.E.N., NEDVĚD O., PEDERSEN J. RABITSCH W., ROY H.E., TERNOIS V., ZAKHAROV I., ROY D.B., 2008 - *Harmonia axyridis* in Europe: spread and distribution of a non-native coccinellid. *BioControl*, 53: 5-22.
- BROWN P.M.J., THOMAS C.E., LOMBAERT E., JEFFRIES D.L., ESTOUP A., LAWSON HANDLEY L.J., 2011 - The global spread of *Harmonia axyridis* (Coleoptera: Coccinellidae): distribution, dispersal and routes of invasion. *BioControl*, 56: 623-641.
- BURGIO G., SANTI F., LANZONI A., MASETTI A., DE LUIGI V., MELANDRI M., A. REGGIANI RICCI C., LOOMANS A.J.M., MAINI S., 2008 - *Harmonia axyridis* recordings in northern Italy. *Bulletin of Insectology*, 61(2): 361-364.
- CHAPIN J.B., BROU V.A., 1991 - *Harmonia axyridis* (Pallas), the third species of the genus to be found in the United States (Coleoptera: Coccinellidae). *Proceedings of Entomological Society of Washington*, 93: 630-635.
- CODERRE D., LUCAS E., GAGNE I., 1995 - The occurrence of *Harmonia axyridis* (Pallas) (Coleoptera, Coccinellidae) in Canada. *Canadian Entomologist*, 127: 609-611.
- CORNACCHIA P., NARDI G., 2012 - Nuovi dati su *Harmonia axyridis* in Italia (Coleoptera, Coccinellidae). *Bollettino dell'Associazione Romana di Entomologia*, 67(1-4): 51-68.
- CROCÌ F., BRACALINI M., 2011 - Segnalazioni Faunistiche Italiane 510 - *Harmonia axyridis* (Pallas, 1773) (Coleoptera Coccinellidae). *Bollettino della Società entomologica italiana*, 143(1): 43.
- DE ALMEIDA L.M., DA SILVA V.B., 2002 - First record of *Harmonia axyridis* (Pallas) (Coleoptera, Coccinellidae): a lady beetle native to the Palaearctic region. *Revista Brasileira de Zoologia*, 19: 941-944.

- DESSI G., 2009 - Forum Entomologi Italiani. <http://www.entomologiitaliani.net/public/forum/phpBB3/viewtopic.php?f=250&t=2787&hilit=Harmonia+axyridis>
- DOBZHANSKY T., 1933 - Geographical variation in ladybeetles. *American Naturalist*, 67: 97-126.
- GIGLI M., 2010 - Forum Entomologi Italiani. <http://www.entomologiitaliani.net/public/forum/phpBB3/viewtopic.php?f=250&t=11007&hilit=Harmonia+axyridis+lazio>
- GOBBI M., LENCIONI V., 2009 - Alieni a sei zampe. Insetti "esotici" in Trentino. *Natura Alpina*, 60(1-2): 21-28.
- GONZÁLEZ G., KONDO T., 2012 - Primer registro de la especie invasora *Harmonia axyridis* (Pallas) (Coleoptera: Coccinellidae) en Ecuador. *Boletín de la Sociedad Entomológica Aragonesa (S.E.A.)*, 51: 310.
- GORDON R.D., 1985 - The Coleoptera (Coccinellidae) of America north of Mexico. *Journal of the New York Entomological Society*, 93: 1-912.
- GREZ A., ZAVIEZO T., GONZÁLEZ G., ROTHMANN S., 2010 - *Harmonia axyridis* in Chile: a new threat. *Ciencia e Investigación Agraria*, 37(3): 145-149.
- IABLOKOFF-KHNZORIAN, S.M., 1982 - Les Coccinelles Coléoptères-Coccinellidae Tribu Coccinellini des régions Paléarctique et Orientale. Boubée. Paris, France. 568 pp.
- KATSOYANNOS P., KONTODIMAS D.C., STATHAS G.J., TSARTSALIS C.T., 1997 - Establishment of *Harmonia axyridis* on citrus and some data on its phenology in Greece. *Phytoparasitica*, 25: 183-191.
- KOCH R.L., VENETTE R.C., HUTCHISON W.D., 2006 - Invasions by *Harmonia axyridis* (Pallas) (Coleoptera: Coccinellidae) in the Western Hemisphere: implications for South America. *Neotropical Entomology*, 35: 421-434.
- KUZNETSOV V.N., 1997 - Lady beetles of Russian far east. The Sandhill Crane Press, Gainesville, Florida.
- MARTINS C.B.C., ALMEIDA L.M., ZONTA-DE-CARVALHO R.C., CASTRO C.F., PEREIRA R.A., 2009 - *Harmonia axyridis*: a threat to Brazilian Coccinellidae? *Revista Brasileira de Entomologia*, 53: 663-671.
- NEDVĚD O., KREJČÍK S., 2010 - Record of the ladybird *Harmonia axyridis* (Coleoptera: Coccinellidae) from Uruguay. *Klapalekiana*, 46: 1-2.
- NEDVĚD O., HAVA J., KULIKOVA D., 2011 - Record of the invasive alien ladybird *Harmonia axyridis* (Coleoptera, Coccinellidae) from Kenya. *Zookeys*, (106): 77-81.
- OLIVIERI N., 2011 - Segnalazioni Faunistiche Italiane 520 - *Harmonia axyridis* (Pallas, 1773) (Coleoptera Coccinellidae). *Bollettino della Società Entomologica Italiana*, 143(3): 138
- ORLANDINI G., MARTELLUCCI R., 1997 - Melone: lotta biologica all'*Aphis gossypii*. *Colture Protette*, 26(6): 33-36.
- ORLOVA-BIENKOWSKAJA M.J., 2014 - The outbreak of harlequin ladybird *Harmonia axyridis* (Pallas, 1773) (Coleoptera, Coccinellidae) in the Caucasus and possible sources of invasion. *Russian Journal of Biological Invasions*, 5(4): 275-81.
- PAGLIALUNGA M., 2010 - Forum Entomologi Italiani <http://www.entomologiitaliani.net/public/forum/phpBB3/viewtopic.php?f=250&t=11240&view=previous>
- PAVESI M., 2008 - Sottostima delle minacce per la biodiversità da parte di specie aliene di insetti, 80. In: G. GALASSO, G. CHIOZZI, M. AZUMA, BANFI E. (eds), *Le specie alloctone in Italia: censimenti, invasività e piani di azione*. Milano, 27-28 Novembre 2008. *Memorie della Società italiana di Scienze naturali e del Museo civico di Storia naturale di Milano*, 26 (1).
- PELL J.K., BAVERSTOCK J., ROY H.E., WARE R.L., MAJERUS M.E.N., 2008 - Intraguild predation involving *Harmonia axyridis*: a review of current knowledge and future perspectives. *BioControl*, 53(1): 147-168.
- POUTSMA J., LOOMANS A.J.M., AUKEMA B., HEIJERMAN T., 2008 - Predicting the potential geographical distribution of the harlequin ladybird, *Harmonia axyridis*, using the CLIMEX model. *BioControl*, 53: 103-125.
- RASTELLI M., 2008 - *Harmonia axyridis* (Pallas, 1773): una potenziale minaccia dalla lotta biologica. *Annali del Settore Fitosanitario Regionale*, 2007: 56-58.
- ROY H., WAJNBERG E., 2008 - From biological control to invasion: the ladybird *Harmonia axyridis* as a model species. *BioControl*, 53: 1-4.
- SAINI E.D., 2004 - Presencia de *Harmonia axyridis* (Pallas) (Coleoptera: Coccinellidae) en la provincia de Buenos Aires. *Aspectos biológicos y morfológicos*. *Revista de Investigaciones Agropecuarias*, 33: 151-160.
- SIDLYAREVICH V.I., VORONIN K.E., 1973 - Trials on using *Leis axyridis* under glass. *Zashchita Rastenii*, 6: 24.
- SILVIE P., ABERLENC H.P., DUVERGER C., BÉRENGER J.M., CARDOZO R., GOMEZ V., 2007 - *Harmonia axyridis* no Paraguai e novos predadores identificados no cultivo do algodoeiro. p. 1. In: *Abstract. X Simposio de Controle Biológico*, 30 June - 4 July 2007, Brasilia, Brasile.
- STALS R., 2010 - The establishment and rapid spread of an alien invasive lady beetle: *Harmonia axyridis* (Coleoptera: Coccinellidae) in southern Africa, 2001-2009. *IOBC/ WPRS Bulletin*, 58: 125-132.
- TEDDERS W.L., SCHAEFER P.W., 1994 - Release and establishment of *Harmonia axyridis* (Coleoptera: Coccinellidae) in the southeastern United States. *Entomological News*, 105(4): 228-243.
- UKRAINSKY A.S., SHAPOVALOV M.I., 2010 - Family *Coccinellidae*: ladybird beetles. In: ZAMOTAJLOV A.S., NIKITSKY N.B. (eds)

Coleopterous insects (Insecta, Coleoptera) of Republic of Adygheya (annotated catalogue of species) (Fauna conspecta of Adygheya 1). Adyghei State University Publication, Maykop, pp 199-201.

ULIANA M., 2008. Nuove segnalazioni di *Harmonia axyridis* (Pallas, 1773) in Italia settentrionale (Coleoptera, Coccinellidae). Bollettino del Museo civico di Storia naturale di Venezia, 59: 51-53.

VAN LENTEREN J.C., BIGLER F., BABENDREIER D., LOOMANS A., 2008. *Harmonia axyridis*: an environmental risk assessment for Northwest Europe. BioControl, 53: 37-54.

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595 - *Harpalus (Harpalus) atratus* Latreille, 1804 (Coleoptera Carabidae)

JEANNEL R., 1942 - Faune de France. Coléoptères Carabiques, deuxième partie. vol. 40: 573-1173.

Prima segnalazione per la fauna sarda di specie Europea.

REPerti. Sardegna: Prov. di Cagliari, Comune di Sinnai, Parco dei Sette Fratelli, Maidopis, V.1978, Fancello L. leg., 1 ♂ (det. & coll. Cillo, Cagliari).

OSSERVAZIONI. Specie a geonemia Europea, diffusa in Gran Bretagna (escluse Isole del Canale), Paesi Bassi, Germania, Belgio, Lussemburgo, Francia (inclusa Corsica), Spagna (esclusa Gibilterra), Svizzera, Liechtenstein, Austria, Repubblica Ceca, Polonia, Slovacchia, Ungheria, Slovenia, Croazia, Bosnia Erzegovina, Jugoslavia (Serbia, Montenegro), Albania, Macedonia, Grecia (esclusa Creta), Bulgaria, Romania, Moldavia, Ucraina, Siria, Turchia, Armenia, Georgia, Azerbaigian e territori sud-europei russi (Löbl & Smetana, 2003; Vigna Taglianti, 2010); dubbia e da confermare in Lituania (Tamutis *et al.*, 2011) e segnalata di recente in Lettonia (Telnov *et al.*, 2011). Presente in tutta l'Italia peninsulare e nelle isole maggiori, eccetto in Sardegna, dove veniva considerata assente (Vigna Taglianti, 2007) o di dubbia presenza (Vigna Taglianti, 2009; Vigna Taglianti, 2010), *Harpalus (Harpalus) atratus* Latreille, 1804 può ora essere confermata per la fauna isolana sarda. Tenzionalmente mesofila, predilige gli ambienti forestali e i terreni umidi, ma si ritrova anche in prossimità di radure o formazioni più aperte, sia in pianura che nelle zone montuose (Magistretti, 1965; Vigna Taglianti, 2007). L'area oggetto del ritrovamento comprende habitat forestali di particolare interesse e specie floristiche e faunistiche di elevata rilevanza, grazie alle quali è stata inserita nel "Sistema di aree d'interesse botanico per la salvaguardia della biodiversità floristica della Sardegna" (Camarda, 1995), nonché considerata come Sito di Importanza Comunitaria (SIC ITB041106) e Zona di Protezione Speciale (ZPS ITB043055) protetta a livello comunitario.

BIBLIOGRAFIA

CAMARDA I., 1995 - Un Sistema di aree di interesse botanico per la salvaguardia della biodiversità floristica in Sardegna. Bollettino della Società Sarda di Scienze Naturali, 30: 245-295.

LÖBL I., SMETANA A. (eds), 2003 - Catalogue of Palearctic Coleoptera. Vol. 1. Archostemata - Myxophaga - Adephaga. Apollo Books, Stenstrup, 819 pp..

MAGISTRETI M., 1965 - Coleoptera. Cicindelidae, Carabidae. Catalogo Topografico. Fauna d'Italia, Vol. VIII. Calderini, Bologna.

TAMUTIS V., TAMUTĖ B., FERENCA R., 2011 - A catalogue of Lithuanian beetles (Insecta, Coleoptera). Zookeys (121): 1-494.

TELNOV D., VILKS K., PITERĀNS U., KALNIŅŠ M., FÄGERSTRÖM C., 2011 - Contributions to the Knowledge of Latvian Coleoptera. 9. Latvijas entomologs, 50: 20-26.

VIGNA TAGLIANTI A., 2007 - I Coleotteri Carabidi (Coleoptera: Carabidae). In: NARDI G. & VOMERO V. (eds.) - Artropodi del Parco Nazionale del Vesuvio: ricerche preliminari. Conservazione Habitat Invertebrati, 4. Cierre Grafica Editore, Verona.

VIGNA TAGLIANTI A., 2009 - An updated checklist of the ground beetles (Coleoptera: Carabidae) of Sardinia. In: Cerretti P., Mason F., Minelli A., Nardi G., & Whitmore D. (eds.) - Research on the Terrestrial Arthropods of Sardinia (Italy). Zoo-taxa, 2318: 169-196.

VIGNA TAGLIANTI A., 2010 - Fauna Europaea: Carabidae. In: AUDISIO P. (ed.) - Coleoptera. Fauna Europaea version 2.2. <http://www.faunaeur.org> [Ultimo accesso settembre 2014, versione 2.6.2].

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ATTI SOCIALI

**Festeggiati i cent'anni della consocia decana
Maria Matilde Principi**

La consocia professoressa Maria Matilde Principi, Emerito dell'Università di Bologna, già Ordinario di Entomologia agraria e Direttore per un trentennio dell'Istituto di Entomologia "Guido Grandi" dell'Ateneo felsineo, il 4 maggio scorso ha serenamente tagliato il traguardo del secolo di vita, un'età che nessun altro entomologo italiano aveva mai raggiunto. Oltre che per età, la prof.ssa Principi è decana della Società Entomologica anche per anzianità d'iscrizione: aderì infatti al nostro sodalizio nel 1938, quasi ottant'anni fa.

Nella ricorrenza è stata festeggiata a Bologna in un incontro augurale che ha avuto luogo a casa sua. Erano presenti il Magnifico Rettore dell'Università prof. Ivano Dionigi, il Presidente dell'Accademia Nazionale Italiana di Entomologia prof. Romano Dallai (in rappresentanza anche del nostro Presidente prof. Francesco Pennacchio) e numerosi colleghi e allievi d'Università, collaboratori ed estimatori. Il prof. Dionigi nell'occasione ha conferito alla professoressa la spilla con Sigillum magnum dell'Alma Mater Studiorum. In un breve discorso Maria Matilde Principi ha ripercorso le principali tappe della sua vita tra impegni accademici, didattici e di studio e ricerca, questi ultimi incentrati principalmente su due tematiche: i Neurotteri e la difesa integrata delle colture. Un caloroso brindisi ha suggellato un evento permeato di stima, riconoscenza, cordialità e amicizia.

La Società Entomologica Italiana esprime alla prof.ssa Principi le proprie felicitazioni e gli auguri più fervidi.

* * *

CONVOCAZIONE DI ASSEMBLEA GENERALE ORDINARIA

L'Assemblea Generale Ordinaria dei Soci della Società Entomologica Italiana è convocata presso la Sede di Corso Torino 19/4 scala A – Genova, venerdì 11 marzo 2016, alle ore 15:00 in prima convocazione e

sabato 12 marzo 2016 alle ore 15:00

in seconda convocazione, con il seguente

ORDINE DEL GIORNO

- 1) Convalida dei soci presentati dal Consiglio.
- 2) Comunicazioni della Presidenza.
- 3) Relazione dei membri del Consiglio.
- 4) Bilancio consuntivo esercizio 2015 e previsioni per il 2016.
- 5) Pubblicazioni sociali.
- 6) Varie ed eventuali.

I soci che non potessero intervenire possono farsi rappresentare da altri soci con delega scritta.

BOLLETTINO DELLA SOCIETÀ ENTOMOLOGICA ITALIANA
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